VOLUME 24 APRIL, 1918 NUMBER 292

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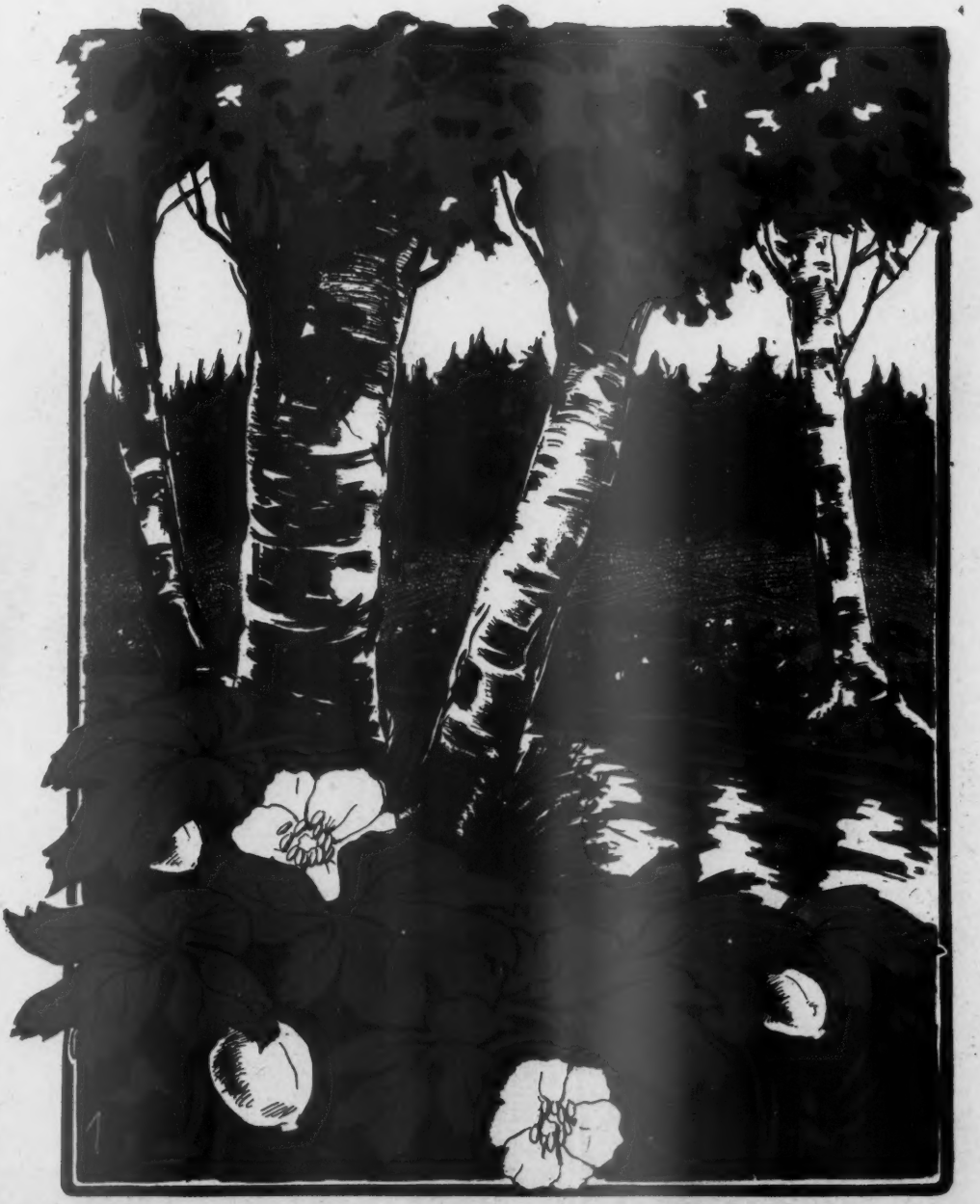
A. S. BURLESON, Postmaster General.

American Forestry



An Illustrated Magazine about Forestry and Kindred Subjects Published Each Month by the American Forestry Association, Washington, D. C.

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Grade-One Liquid
Creosote Oil

Economical Emergency Construction

CARBOSOTA CREOSOTE OIL and timber is a wonderfully efficient combination for first-class, economical, and durable emergency construction.

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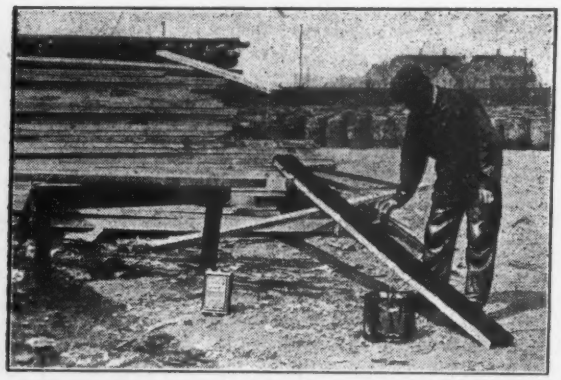
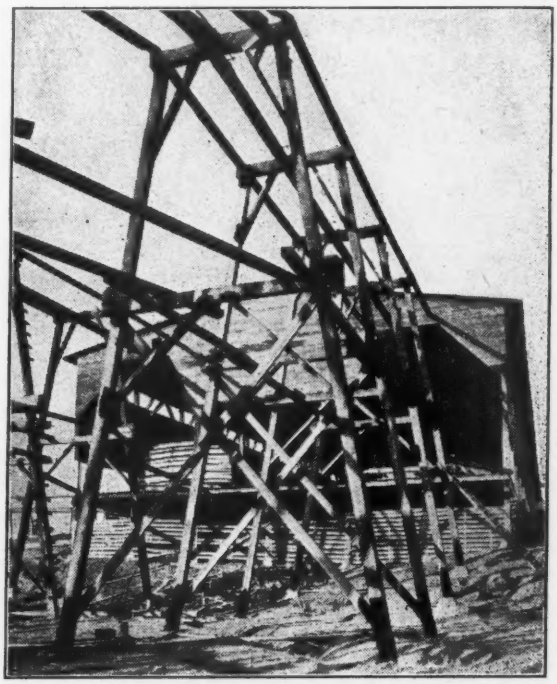


The Brush Method of Creosoting Wood



Carbosota Creosote Oil applied by the Brush Method to all points of contact, mortises, and tenons. Trestle erected by Tremont Lumber Company, Rochelle, La. (Courtesy *American Lumberman.*)

Creosoting by the Brush Method *has already resulted in an increase of several years* in the life of large timber structures; *one year additional life more than pays for the entire cost and trouble.*

Carbosota Creosote Oil is the Standard for the Brush Method and Open-Tank System.

(Green wood cannot be effectively creosoted by non-pressure process. It should be air-dry. In regions of moist, warm climate, wood of some species may start to decay before it can be air-dried. Exception should be made in such cases, and treatment modified accordingly.)

Technical assistance, specifications, and any other information regarding the Carbosota treatment may be obtained gratis by addressing nearest office.

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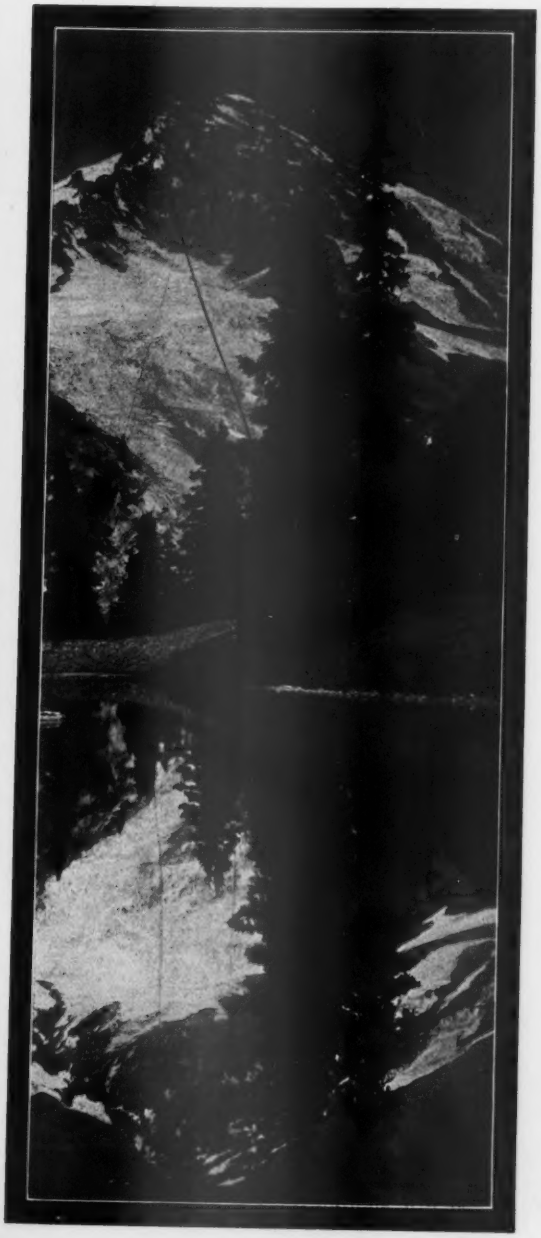
AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

APRIL 1918 VOL. 24 CONTENTS No. 292



RAINIER, THE SNOW QUEEN, REFLECTED IN MIRROR LAKE, RAINIER NATIONAL PARK.

Entered as second-class mail matter December 24, 1909, at the Post-office at Washington, under the Act of March 3, 1879.

Copyright, 1918, by the American Forestry Association.

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For Every Reason

Now is the time to buy timber. Market values are already on the up grade. They would be due for a rise even if times were normal.

Under present circumstances the upward pressure is doubly strong.

Buy Timber Now!

The war, when we were out of it, promised a great market for lumber in the near future. Now that we are in the war the demand is heavy, immediate and pressing, with promise of after-war demands greater than before. Everything points with unmistakable directness toward investments in timber now — today.

We have or can get what you want.

James D. Lacey & Co.

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AMERICAN FORESTRY

VOL. XXIV APRIL, 1918 NO. 292

"KEEP THE FOOD COMING"

BY CHARLES LATHROP PACK

PRESIDENT, NATIONAL WAR GARDEN COMMISSION

"KEEP the food coming!"

That is the message which General Pershing recently flashed from the other side to the people of America.

War gardeners of the United States, that is the call to you from the man who is charged with the care of all your sons, brothers, friends and fellow-countrymen who are now in France fighting and sacrificing that you may be safe and that the world may be made a decent place to live in.

This is the day of big things. We look out upon the world and everything seems to be done on a colossal scale. Money is appropriated by the billions, and figures which a few years ago would have staggered the imagination are now spoken of as lightly and as unconcernedly as were hundreds and thousands formerly.

At the same time this is still the day of small things also. It is by the aggregate of tiny sums that the vast totals are made up. It is by the small Thrift Stamps—the "baby bonds"—that the government is gathering many of the millions which are needed to carry on the war. The pennies which are collected daily at the moving picture houses and through hundreds of other apparently insignificant sources are helping to swell into deep, wide golden streams the trickling rivulets of money. Small donations make up most of the millions which are raised by the Red Cross, the Y. M. C. A. and other organizations for their great war work.

"PLANTING FOR THE FLAG"

This is the "headquarters at the front" in the war garden campaign of the General Electric Co. at Schnectady, N. Y. Similarly the American flag is flying in spirit, if not in reality, over every spot in back yard or vacant lot where home "soldiers of the soil" are producing the food which is essential to victory. "Food Must Follow the Flag."

The same is true of war gardens. Each one is small. But when they are gathered together they have the force of a Niagara. Standing by the side of that resistless waterfall it is difficult to realize that it is made up of tiny drops.

"Papa, why should I save a slice of bacon? It cannot feed an army," said a little girl to her father.

Then he took her down to the waterfront and showed her six big ocean-going vessels which were lying there.

"Dorothy," he said, "do you know that if every little school girl in the United States were to save one slice of bacon a day, it would fill all of those ships with food for the American soldiers in France?"

"And after that," said the father in telling the story afterwards, "I had trouble in making her eat anything."

That is the spirit in which the people of America have gone into the home food production work. Every member of the vast army of soldiers of the soil recognizes that his or her share, no matter how small, is just as important as if it were big enough to feed the whole army.

It has been estimated on a conservative basis that five million war gardeners can raise enough food to supply an army of 1,000,000 men for eight months. When it is considered that each soldier gets four and a quarter pounds a day, which means 4,250,000 pounds for 1,000,000 men and what this would total in eight months, some idea

is gained of the great patriotic service which the back yard and vacant lot tillers are performing.

From coast to coast they are lined up. There is a democracy about this army which makes it truly inspiring. It includes in its ranks men and women of wealth and prominent social position and workers in our mills, mines and factories; women who have passed the age of four score and young college girls; veterans of the civil war and school children of tender years; in fact, people of every class and age.

Industrial and manufacturing concerns of all sorts are taking an especially active part in the war garden campaign this year. Hundreds of them in all parts of the United States are helping their employees in this way to serve themselves and their government at the same time. The comparatively small number of plants which had gardens last season has grown into a formidable list. Those that had gardens last year have gone into the work more intensively this year, while the encouraging reports from these concerns have inspired other companies everywhere to start a similar undertaking. This report from one of the plants where war gardening was conducted last year for the employees is typical of many others. It says:

"HANDSOME IS AS HANDSOME DOES"

This is the motto which might well be given to this beautiful front lawn of a New Haven, Connecticut, home. The vegetables which are growing around the Italian marble fountain breathe an Americanism and a love of liberty which is above any artificial decoration. The next picture shows the garden more fully developed.

"Besides the material gain, the garden work promoted a fine spirit of democracy and fellowship among the men. The president of the company and each one connected with it down to the humblest employee had a plot, and officers and employees, working together as they did, found mutual interests and fellowship therein."

The United States Steel Corporation, in a report to the National War Garden Commission on the plans for this season, stated that many of its subsidiary companies had found the garden work among the employees highly satisfactory and had arranged to extend it and carry it on more intensively this year. In 1917 at its various subsidiaries, according to the report, there were planted a total of 18,451 war gardens. Here is the statement from one of the companies, the American Sheet and Tin Plate Company:

"In all there were 54 acres planted and cultivated. The estimated valuation of all vegetables raised is about $10,974. There were many mill gardens cultivated and it is reported that employees were very enthusiastic and much good has been accomplished by this means."

At the Carnegie Steel Company, Mingo Junction, Ohio, "plots were taken by men in all classes of employment, laborers, skilled operators, clerks and executives, a large number of them without previous experience. A complete variety of produce was raised. Much spirit and rivalry developed among the gardeners, this being increased by the prizes offered. In spite of the fact that the river flooded twice, two of the prizes were taken by workers in the flooded area." The plots showed a general average of excellence of more than 80 per cent, and only one was marked a failure.

Word comes from Arizona that the Inspiration Consolidated Copper Company, whose employees had 217 acres of gardens last year—"the largest war garden in the world," it was claimed—has increased the area this year. J. R. Sandige, gardening expert from the University of Arizona College of Agriculture, is again giving instructions to the miners in the work. The General Electric Company, Schnectady, New York; the American Rolling Mill Company, Middletown, Ohio; the Oliver Chilled Plow Company, South Bend, Indiana; the New York and Pennsylvania Company; the Universal Port-

land Cement Company, with plants at Pittsburgh, Duluth, Minnesota, and Buffington, Indiana; the United Coal Corporation, Pittsburgh; the North American Motors Company, Pottstown, Pennsylvania; the Delaware and Hudson Coal Company, and a long list of other large industrial concerns are again furthering war gardening among their men.

The railroads of the country are encouraging and assisting their men in the same way, allowing them the use of such land along the right of way as is not needed for actual railroad purposes. As an illustration of this cooperation, the Pennsylvania Railroad Company distributed among its employees this spring more than 10,000 copies of the war vegetable gardening booklet furnished to them by the National War Garden Commission, and posted in its stations 2,000 copies of the Commission's poster, "Sow the Seeds of Victory." All division superintendents and other officials were supplied with the garden books and they were given out all along the line. Similarly the Missouri, Kansas and Texas and other roads are working with the Commission to produce a big supply of food f. o. b. the kitchen door.

A GARDEN THAT COUNTED

The little god on the top of the fountain must look down with happy contentment on the fine array of beans which this war garden has produced. And so it will be with every bit of land in the United States which is working to "make the world safe for democracy." In addition to its practical and utilitarian value the home vegetable plot is to be pointed to with pride for its actual beauty.

The appeal to the railroad employees was particularly strong because they realized better than any other class of people the great benefit which home gardening brought to the freight transportation situation. They had seen the congested freight yards with cars standing there by the hundreds and unable to move and with many other tons of supplies waiting to be loaded for shipment. They knew that thousands of cars would be relieved for other essential war work if every community would raise as much as possible of its own food. With the practical value of home gardening thus impressed upon them, it is not to be wondered at that the railroad men eagerly took advantage of the opportunity to plant gardens when it was offered them.

The banks of the country, which have stood behind the government so loyally in every movement to win the war, Liberty Bond selling and all the rest, have taken an active part also in stimulating the war garden campaign. Hundreds of these institutions, in large cities and small, have distributed to their patrons copies of the Commission's garden booklets; and in this way have spread the gospel of food production broadcast. In many cases the banks have organized garden clubs of their own and have furnished plots of land which their clerks, and frequently officials of the banks, cultivated. In other ways, too, the banks have cooperated. The New York State Bankers' Association, for instance, sent out a notice to all its members, calling their particular attention to the value of war garden work and to the good they could accomplish by endorsing and encouraging it in their communities.

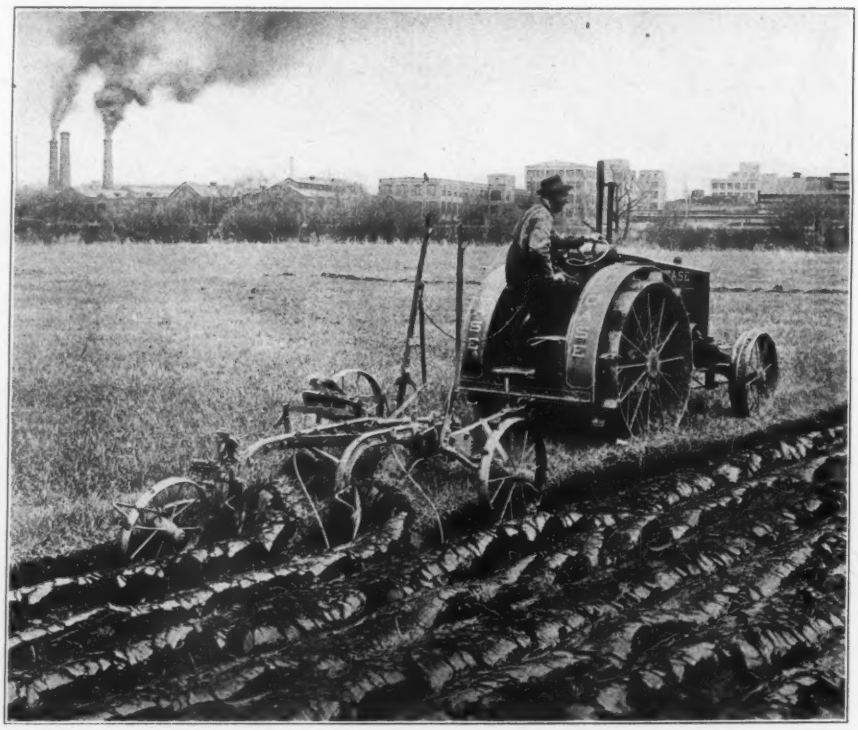
Superintendents of schools all over the country have stressed the home garden movement. They have urged upon the teachers under them the benefit which the children would derive from this form of combined study, exercise and service to country. That the lessons will be lasting there is no doubt. Thousands of school children who had been asking what they could do to help their country win the war, have found a satisfactory answer to the question in their home gardens. There they are building for their own future a happiness and a joy which nothing will be able to take from them. They are helping to make the world a safe place for themselves and their companions to live in, and for the generations which will follow.

"FOOD F. O. B. THE KITCHEN DOOR"

Just a step to the garden patch. This is the help which their war gardens are proving to the employees of the American Rolling Mill Company, Middletown, Ohio. Competition is keen and the workers vie with each other to see which one can produce the finest display of vegetables, and to encourage them in this the company offers a number of prizes.

The knowledge and the beneficial exercise which is being derived from gardening is worth considering from the adult's point of view, as well as from that of the child. The hour spent in the garden is time well spent. More than 5,000,000 people are learning that this year.

But in spite of many reasons which might be given for the value of gardens — money saved, community betterment, addition to a city's wealth and resources, cleaning up of unsightly lots, improved civic spirit, a finer democracy — the one great thought which stands out in letters of shining light before every war gardener in the United States today is summed up in these four words: *America Needs the Food.* That and no other reason makes war gardening worth while.



'NEATH SMOKING OBELISKS OF INDUSTRY

Scenes like this have been enacted all over the United States this year by large industrial and manufacturing concerns which are furnishing land and plowing it for war gardens for their employees. While the big mills are turning out the shells and the equipment needed by the men at the front, the garden plots are growing "ammunition" to provide the rations which are just as essential as guns and bullets.

The people of America only had to be told that Amer-

"DOING HIS BIT"

Even the children at many of the big manufacturing plants throughout the country are helping their fathers in the war garden work. Hundreds of companies are assisting their employees and at the same time helping their country by providing the land for the men to cultivate, in most cases plowing and preparing it for them and aiding them also in other ways.

ica needed the food. As soon as they saw this need and realized that they could make up the shortage in food through home garden cultivation—the only new and unused source of supply—they rolled up their sleeves, got out their broad-brimmed straw hats and began to dig in the garden trenches.

In the campaign of education by which the National War Garden Commission got this message over to the American people and by which it is instructing them how to proceed, daily use is made of garden lessons furnished to the newspapers of the country, while posters, garden instruction booklets and much other literature is distributed. One of the big factors in the campaign has been the slogan. Of these the Commission has used a number at different times.

"Every Garden a Munition Plant" is the one which appears on this year's beautiful garden poster, which is the work of the well-known artist, James Montgomery Flagg. "Sow the Seeds of Victory" is another striking phrase which appears on the poster, above the head of the striding figure of Liberty who, clad in a dress made of the American flag and with a red cap on her head, is scattering seed over a rich brown field.

Among other slogans which have sent their clarion call through the nation, calling on the home gardener to step into the breach and fill up the vitally necessary supply of food, have been the following: "Food Must Follow the Flag," "Speed Up and Spade Up," "Hohenrakes versus Hohenzollerns," "Plan to Plant and Win the War," "Keep the Home Soil Turning," "Get into the Garden Trenches," "The Hoe is the Machine Gun of the Garden," "Spade for Your Life and Liberty," "Let There Be No 'Slacker Land,'" "Food F. O. B. the Kitchen Door," "Make the Pantry Shelves Sag and Break the Kaiser's Back" and "The Battle Cry of Feed 'Em."

"This morning I just turned in, on my 87th year, to cultivate three lots in vegetables," wrote Paul Williams, a Civil War veteran, of Shelby, Indiana, in a letter to the Commission, requesting a copy of the War Vegetable Gardening Booklet. He declared that he wanted to grow "his bit of ammunition."

After the war one of the questions which is going to be asked most frequently will be, How did you help? No matter how old one lives to be that will still be a subject of inquiry.

To this question many millions of Americans will have the satisfaction of replying:

"I planted a war garden. I helped to feed myself and thus to feed the army."

No matter in how many other ways one may have helped, the importance of food is so great that anyone who had the opportunity of growing a garden and did not take advantage of it, will always have something to

regret. Fortunately there will be few "slackers" of that variety just as there will be little "slacker" land in the United States this year, few back yards and open spaces in our cities and towns that will not be displaying a fine array of beets and onions and peas and beans and other vegetables.

From the reports which have come to the National War Garden Commission it is easy to judge of the wholehearted and enthusiastic manner in which America has responded to the call to "Keep the Home Soil Turning." The good start which was made last year when the Commission began its nation-wide campaign to increase the nation's food supply through home gardening, has borne fruit a hundred fold this season. Like the proverbial mustard seed it has spread until today there cannot be found a city, town or village in the land which is not doing its duty in this direction.

Clubs and organizations of all sorts, committees of the various state and county councils of defense, county farm bureaus, chambers of commerce and other trade bodies, manufacturing plants and big industrial concerns, railroads, banks and business houses, colleges, schools and libraries, these and many others have joined in to support, by their endorsement and active participation, the vital work of producing food. "Food must follow the flag" they were told; and they set about organizing committees and community clubs to plant gardens.

The "City Farmer" today ranks with any of the other workers who are making it possible for the United States and her Allies to continue the war. In numbers the war gardener has jumped at a bound from insignificance to almost top place, for with the exception of agriculture there is no occupation in which more people in this country are now engaged. In the value of his product, also, the city farmer takes high place.

Only a few years ago "the man with the hoe" was spoken of pitifully or made the subject of jest. Today he has become a bulwark of the nation; democracy looks to him for light and help; and he is held in high honor. It is with deep respect and with due reverence that we speak today of the "soldier of the soil." The hoe has become a mark of merit which any American citizen can be proud to display. He will always be able to point to it with pride as the weapon with which he did his part to help "make the world safe for democracy" and save his nation and world freedom in its day of dire peril.

DONATIONS TO THE WELFARE FUND FOR LUMBERMEN AND FORESTERS IN WAR SERVICE

AMERICAN FORESTRY will publish each month the list of those making donations to this fund. Many of the donations from members of the American Forestry Association so far received were made without solicitation and were inspired by reading in the magazine that a relief and comfort fund for men of the forest regiments was to be started. Many substantial contributions are being received from lumber companies and lumbermen following requests sent to them by the Secretary of the Welfare Fund for Lumbermen and Foresters in War Service, by the lumber organizations of which they are members, and by the committees of lumbermen which had charge in various sections of the United States of securing enlistments for the forest regiments. Contributions to April 15, 1918, are as follows:

Previously acknowledged	$11,825.18
Amsler, Col. C. W.	10.00
Angelina County Lumber Company	10.00
Barnes, Miss Anne Hampton	20.00
Beckwith, Mrs. Daniel	25.00
Berwind, John E.	100.00
Birkle, John A.	3.00
Blanchard Lumber Company	25.00
Blytheville Lumber Company	10.00
Borreson, Jules T.	10.00
Bradley, E. J.	5.00
E. P. Barton Lumber Company	50.00
Case Fowler Lumber Company	10.00
Chapman, S. F.	25.00
Cherry River Boom and Lumber Company	100.00
J. S. H. Clark Lumber Company	10.00
S. P. Coppock & Sons Lumber Company	10.00
Cornell Foresters	15.00
Douglas Fir Club	520.00
Eckert, Harry K.	3.00
Ellington & Guy, Inc.	10.00
Tommy and Betty Fleming	25.00
Gelpcke, Miss A. C.	5.00
Gerrans, R. D.	4.00
Hayes, Rutherford P.	5.00
Hebard Cypress Company	100.00
Higgins Lumber Company	25.00
Hudson River Lumber Company	10.00
Illinois Lumber and Builders' Supply	25.00
Indiana Quartered Oak Company	25.00
J. S. Kent Company	10.00
Keystone Lumber Company	50.00
A. S. Kibbee & Son	25.00
Klumle, C. E.	10.00
Kreamer Lumber Company	5.00
Lufkin Land and Lumber Company	10.00
C. C. Mengel and Bro. Company	25.00
Merritt Bros., Inc.	25.00
Milne, Hall & Johns Co., Inc.	25.00
Morrow, Dr. William G.	1.00
Newell Lumber Company, Ltd.	10.00
Norton, E. E.	10.00
Norwich Lumber Company	100.00
Pickett, Hyde & Langgans Company	10.00
Pine Plume Lumber Company	25.00
Schofield Bros.	25.00
George W. Stoker & Son	5.00
Teal, Joseph N.	10.00
Wadesboro Lumber Company	10.00
Walterboro Lumber Company	50.00
Warner, John	5.00
Weller, Miss Mame E.	5.00
W. M. Weston Company	25.00
Williamsport Hardwood Lumber Company	10.00
Wister-Heberton Company	5.00
Woolman, Edward	5.00
Total	$13,511.18

AT the request of the city administration, the United States Forest Service will donate 30,000 yellow pine and Douglas fir transplants from the Monument Nursery for planting along the highways throughout the Denver mountain parks system, next spring.

THE Forest Service seed extracting plant near Fraser on the Arapbao Forest was recently destroyed by fire. The buildings and equipment, together with 2,500 bushels of lodgepole pine cones awaiting extraction were burned.

FRANCE AT WAR

BY RODERIC MARBLE OLZENDAM

SECRETARY, VERMONT FORESTRY ASSOCIATION

FRANCE at war is a vast and illuminating subject which will undoubtedly in the future fill many volumes full to the brim with events and episodes. with battles, with tales of heroism and daring of fortitude and courage, of sacrifice and suffering such as the world has seldom known before, but through which the people of this great Republic have passed cheerfully, with head and heart high and an indomitable courage unequalled.

To tell of France at war in one brief article necessarily limits the writer to a hasty scanning of the subject and the omission of many details which might otherwise prove interesting. We must wait until the volumes of history are turned from the pen of the historian before the tale will even begin to be unfolded.

One may read all the books and magazines, all the papers and periodicals on the war, as well as listen to all manner of speeches intended to arouse interest and active enthusiasm for the war, but to have a clear conception of France at war, a vivid impression of the activity of the past three years, it is absolutely necessary to set foot on French soil and proceed step by step from southern France up to and through Paris and beyond to the little villages with their narrow winding streets and further still to the long country roads down whose tree-bordered cobble-stoned aisles the Germans marched in their retreat from Paris.

A LANDSCAPE BY MARS

The charmingly picturesque little village of Chaules, which once cuddled in a forest in the district of the Somme, has been completely obliterated by heavy shell fire, and this pathetic scene is a common one now.

The entire French nation is at war, not merely the soldiers, but everybody, men, women and children, all are engaged in some capacity. France has lost over a million of her best men in dead and wounded, and France is a small nation compared with America. Then add to this solemn fact the fact that the majority of the battles have been waged on French soil, French hamlets have been laid low and French fields rendered useless, and you begin to get a glimpse of what she has undergone.

France is fighting for her very life. Not until this same spirit of national solidarity which permeates all France is suffused throughout America will we accomplish those things which the President has set as our task.

The most heroic, the most courageous and the most inspiring figures in all this vast theatre of war are those women of France who are the mothers and grandmothers, the sisters and wives of the men who have gone forth from their fields and shops, their marts and vineyards to give all they have that France and all the world might be saved from the onrushing invader. Theirs are the burdens of greater weight, theirs are the sorrows far more bitter and deep, theirs are the anxious waitings and longings the like of which the world has never known before. All those whom they hold most dear in life have gone from them they know not where. They must remain at home, working as never woman worked before at the same old humdrum tasks from sunrise till long after the shadows lengthen and the evening comes. The men go out to new experiences, new conditions, new fields and often to portions of the country hitherto unknown to them. Not so the women. In the fields they do the work which once strong men grew weary in the doing; in the stores and shops, in the vineyards, everywhere, the women have taken up the work which once taxed the strength and nerve of rugged men and they do it with a look of resigned courage and dogged determination which is the spirit of all France. The war without this type of women would be an absolute impossibility and they deserve the gratitude of all the allied nations.

Comradeship and fraternity between men and men and between men and officers is quite apparent in the French army. The cheer and good will which actuates the "poilus" is truly wonderful. They emerge from their underground life in the trenches, dirty, grimy, muddy, tired, possibly with the trench itch or some equally trying disease, carrying a pack often weighing fifty pounds or more and they come swinging through the villages led by their bands, at a step so quick and full of life that one marvels at their almost endless vigor. They return to the trenches with the same characteristic determination to stay until the last gun has been fired, until the last star shell has flared up and died away and the last battle plane has soared aloft over the enemy lines, until there is in very truth, "peace on earth, good-will to men," and a League of Nations to see to it that Democracy shall prevail in every nation under the sun and right and truth shall have their everlasting due. Our American boys have gone to France with the same steadfast purpose and they will stay until the curtain is rung down on the last act, in spite of all the trying obstacles which may tend to swerve them from their chosen path.

One night when on duty as an ambulance driver at one of our most advanced posts behind the French lines, a battalion came down the camouflaged road out of the inky blackness and paused to rest close by our post before taking up the final kilometers march to the trenches. The men fell out at a low whistle from their commanding officer. A poilu came up to the ambulance where my friend and I were sitting and asked us if we belonged to the American Red Cross. With our broken and often unintelligible French we carried on a conversation with him. While we were talking a man approached and placing his hand on our friend's shoulder asked him for a drink of "pinar" from his flask. Pinar is a brand of cheap war wine which the French soldiers drink instead of water. Every poilu carries a flask of pinar at all times. Our friend reached for his flask and removing the cork, handed it to the man whose face and uniform could not be seen because of the great darkness. The man drank deeply, thanked the poilu and walked away. As soon as the figure had become indistinguishable in the night, our friend turned to us and said that that was their commanding officer who was in charge of the battalion and that he had walked twelve kilometers with the men. I tell this little incident to show the spirit of fraternity and equality which apparently exists between the French officers and men. This is undoubtedly due to the fact that many of the officers have risen from the ranks and know full well the hardships of the French private.

The Alpine Chasseur bands are very fine indeed. In every Chasseur band, besides the usual number of instruments, there are sixteen men with French hunting horns. To hear these bands as they come down one of the streets of a little French village at the head of a battalion on the way to or from the front is exhilarating to a degree. When the men are "en repos" in some village behind the lines these bands practice nearly all day and one is surprised to hear them playing parts of the world's most famous operas with a skill and technique worthy of our largest and most widely known military bands.

Thus very briefly I have traced France at War as it appeals to me. Doubtless to other Americans who have visited the war zone other phases of the work would be outstanding. France at War is a nation consecrated, every man, woman and child. With this spirit France can never lose.

France, sore distressed, called out in pleading tones to America three thousand miles away, and America has heard and America is coming and America will stick until war shall cease forever. That is what France confidently believes. Then a League to Enforce Peace will be uppermost in the minds of men and a foundation will be laid upon the blood of countless thousands and upon that foundation the structure of universal peace will be built. He who lags behind at such a time as this only postpones that for which all the world looks and longs, a permanent international peace.

LUTHER GOODRICH JONES, son of W. Goodrich Jones, president of the Texas Forestry Association, is in France with the Tenth Engineers (Forest). He writes home that since September he has been engaged in work of various kinds in the French forests, from swamping and tree-felling to surveying. At the time of last writing he was a clerk in battalion headquarters office, where his familiarity with French, Spanish and German was valuable. Young Jones graduated from Princeton last June.

Photographed by International Film Service.

UNIQUE POSITION OCCUPIED BY GERMAN SNIPER

This is the refuge occupied by a Boche sniper who for many months took a toll of many lives, and made existence miserable generally for the men in the first line trenches of the Aisne sector. His career came to a sudden end when he was discovered by a French raiding party, and one of the poilus who helped capture the stump posed in it for this interesting picture.

DWELLERS IN THE FREE FOREST FORCED TO FLEE BEFORE THE GERMAN GUNS

PAUL AYRES, in the New York *Globe*, tells a most interesting story about the people who for hundreds of years inhabited the Free Forest—the Buschkanters—based on facts brought together by W. M. Bocquet and E. Hasten, historians of the region of Dixmude and Ypres. Not only have the people of the cities of Belgium been driven from their homes by the big guns of the relentless Hun, but these people, who for centuries have lived as freely as the gypsies, have been driven from their ancient stronghold by the fierce bombardment of the forest of Houthulst. We quote:

"The forest of Houthulst, which is called in Flanders the 'Vrybusch' (the 'Free Wood') formerly extended from Ypres to Wynendaele and from Roulers to Dixmude. The earliest known mention of it is upon a map by Abbe Nicolas de Corbie, which dates from 1096. Reduced in extent from century to century, this forest in 1829 entered into the hands of two private owners, who when they wished to enforce their rights, met with desperate resistance from the Buschkanters. Regular battles were fought in the forest between the public forces and the owners, the victory falling to the former. And so it was necessary to take into consideration the demands of the Buschkanters, to grant them privileges and to admit their right to remain in the forest, which, according to their beliefs, was the rightful property of the poor.

"The Buschkanters are broom and brush manufacturers, wooden shoemakers, and also poachers. The forest of Houthulst is their domain. They reign therein as absolute masters. They are a thick-set race, with dark curly hair and beards, somber eyes under heavy brows, round heads and olive complexions. Thus they have nothing in common with the French type, but appear to be the direct descendants of the Mongolians, the most ancient of the races known to have inhabited Belgium. They were there first, and so completely are they still the men of the Stone Age that they continue to use instruments of polished stone dating from past centuries—at least they did before the war.

"In appearance the Buschkanter is like a tramp, although his expression is frank and honest. As a rule he wears green or garnet-colored embroidered slippers, dark velvet trousers, braided along the seams, a short vest trimmed with two rows of pearl buttons, a colored neckerchief, and a cap worn well down on the back of his head, leaving uncovered his long, dark curls that glisten with oil.

"His wife wears a bright-colored skirt and bodice. Neither hat nor bonnet covers her carefully oiled hair. To indicate her love of luxury, gold pendants adorn her ears and breast. On kermis days the Buschkanters come down to the village, where there is much feasting, which ends generally in sanguinary disputes.

"In the Houthulst forest they live according to their own established laws, regardless of other social rules. The ground on which they erect their huts is theirs by right of conquest. According to tradition, when a clansman wishes to build his home he seeks a favorable spot in the forest, to which he secretly conveys the tools he requires for its construction, and then he calls together the other members of his clan and informs them of his intentions. If it is found that in a single night the building is far enough advanced for a bundle of brushwood to be burned in the chimney the hut and the ground immediately becomes his property.

"But this was not a very difficult task, for the home of the Buschkanter is little better than a hovel, the frame standing on four wooden piles driven into the ground, while the walls are constructed from the branches of trees, the interstices being filled with straw and dried ferns. Over all is spread a coating of clay which is finally whitewashed.

"The cabin consists of one room, containing a fireplace, composed of three stones, which form a triangle around a hole in the earth. The floor is of beaten earth, like that of a barn. In the center of the room is the trunk of a tree, on which at meal-time a plank of wood is placed to serve as a table. Chairs are lacking, but there is a meal-tub, and on the wall a poacher's gun.

"The Buschkanters live on the products of the forest. It furnishes them with an abundance of game and the material they require to carry on their industries. Free of any tax, they cut down the trees, and, with the brooms, brushes and wooden shoes which they manufacture, they go from village to village, from door to door, in quest of purchasers. Thus they travel through Flanders, Wallonia and northern France and some even continue into Germany and Russia.

"With their load of brooms on their backs, their brushes dangling from their necks and belts, the eternal accordion, which never leaves them and which they play in their hours of ease, they wander far and wide, returning always to their wives and parents in the forest at Christmas and Easter. From the cities through which they pass they borrow words which their tribesmen finally adopt. Thus their dialect is a mixture of Flemish, Walloon, French, German and Spanish.

"In the year that immediately preceded the war the Buschkanters had begun to adopt more civilized methods. A brush factory, fitted up with modern machinery, was installed in Houthulst, and a large industry was carried on by the men of the forest. But the war came and drove them from their haunts, scattering them in various directions. The forest itself, the ancient forest of these free men, has been destroyed by cannon. The end of the Buschkanters is in a way the end of ancient Flanders."

INDIAN MEDICINES MADE FROM TREES

BY HU MAXWELL

COMMON tradition attributes to the Indian doctors a wide acquaintance with medicinal plants and a profound knowledge of the curative qualities of herbs. That notion was held by some people who knew the Indians in pioneer times, but usually such persons were not competent judges of a physician's abilities, and an opinion from that source was not worth much. There is no question that some Indian doctors met with considerable success in curing the sick when dealing with simple diseases only; but accounts of Indian doctors curing cancer, tuberculosis, hydrophobia, and cholera, should be accepted with caution. The outstanding fact of greatest significance was the redman's usual willingness to risk a white physician in preference to one of his own race, when he had the privilege of choosing between them. He had no supreme confidence in the savage doctor with his combination of good medicine and deceptive jugglery; for the two usually went together in the redman's medical practice. For that reason it is difficult for investigators of the present time to arrive at a just estimate of the real merit in the Indian's medicines and methods of applying them. This observation is intended to apply more to the tribes which occupied the eastern part of the United States from one hundred to three hundred years ago than to those which still live in the western part of the country.

LEAF OF BEECH TREE

Northern Indians made poultices of beech leaves which adhered to the twigs all winter and were easily procurable in time of deep snow. They were a frostbite remedy.

Within the past forty or fifty years, studies of Indian medicines have been made by competent scientists who have sojourned among the western tribes, gained their confidence, and learned what medicines the half-savage doctors use and for what purposes and with what effects they are employed. The United States Bureau of Ethnology has compiled and published valuable bulletins on Indian medicines of modern times. In these bulletins the botany of plants is correctly given and the methods of preparing medicines are set forth in detail. But information of so accurate and satisfactory a character was very scarce in early years in the eastern part of the United States. It is greatly to be regretted that competent scientists did not collect and preserve Indian medical knowledge in early years when there was so much that might have been learned. Intelligent writers on the frontiers were few then, and a great deal of interesting and perhaps valuable information concerning the Indian doctors and their medicines has been lost beyond recovery. The best that can now be done in the way of preserving some of the fragments of Indian medical practice in the forested regions of eastern North America is to search through the books of early travelers, traders, missionaries, hunters, and adventurers. A scrap is to be found here and there which throws a little light on the subject; but such mention nearly always seems to have been accidental. There is no lack of books, and it is remarkable that so much could be written and so little be said on the subject of Indian medicines. Many a frontier writer dwelt at great length upon the practices of Indian conjurers who pretended to cure the sick by beating drums, shaking rattles, and dressing in bear skins and buffalo horns, and dancing before the patient; but few and short are the actual accounts of the preparation and administering of medicines, though that must have been of common occurrence in the Indian camp and village. It is highly probable that the conjurer and his tricks were called upon in those cases only where the disease was not understood, and that medicines were administered in other cases

It is pretty certain that the Indian doctors, deficient though they were in scientific knowledge, did not receive justice from the pens of most early writers. In most cases the redman's shortcomings as a doctor are magnified and his virtues belittled, or the subject is entirely ignored. The most notable instance of this is found in a series of books known as the "Jesuit Relations," by French missionaries who, during one hundred and fifty years, wrote voluminously of life among the tribes from Nova Scotia to Hudson Bay and New Orleans, and had scarcely a word of commendation for Indian medical knowledge or practice. Those missionaries were learned men, and they wrote with the force and fire of the Apostle Paul; but in vain may their seventy-three volumes, which they wrote in French, Italian, and Latin, be searched page by page without so much as one page being found that describes the medicines used by the Indian doctors. The missionaries wrote of things spiritual rather than of those things which appertain to this life and things temporal. This instance is cited merely to emphasize the fact that what is known of Indian medicines has come down from the past as detached fragments.

Among the scores of men who wrote of Indians and of the frontiers, there were a few who gave more or less information relative to the redman's medicines. One of these was Dr. Benjamin Rush, a signer of the Declaration of Independence, and who was the foremost physician of his time. Dr. Benjamin Smith Barton, of Philadelphia, was another, whose works were published considerably more than a hundred years ago. Peter Smith, a practicing physician on the early Ohio frontier and who said that he "had read some medicine," frankly stated in his book: "I learned some of my remedies from the Indians, or learned them in the same way that the Indians learned them." He called himself "a home old man or Indian doctor." His unique book was long out of print but a new edition was issued a few years ago in Cincinnati. Johann David Schoepf, a Hessian army surgeon who fought against the Americans in the Revolution and afterwards traveled extensively on the western frontiers, left a work in Latin descriptive of American medicinal plants, and another in German descriptive of his travels, and he threw much light on the Indians' practice of medicine. John Lawson's "History of Carolina," written two centuries ago, deals with some of the Indian remedies derived from the forest. Peter Kalm, a Swedish naturalist, writing about 1749 from observations made while traveling through the eastern United States and Canada, gave much interesting information on the same subject. C. F. Volney, a Frenchman who traveled through Indiana and Illinois soon after the close of the Revolution, wrote many careful observations of Indians, including their diseases and cures. Information comes from many other travelers who have left books dealing with phases of Indian life.

ARBORVITAE

Indians placed leaves and twigs of this cedar in their beds for the purpose of keeping snakes at a distance. Modern campers use it for decorations and like its odor.

Men who were of the medical profession and were personally acquainted with Indian doctors and their medicines have not left wholly favorable accounts of the redman's proficiency as a physician. His knowledge of certain remedies has been admitted, but his skill in administering them has been called in question. That was the view held by Dr. Rush, while the following summary shows Dr. Barton's opinion:

My inquiries concerning the diseases and remedies of our Indians has convinced me that among these people the art of medicine is truly in a shapeless and embryonic state. It is, nevertheless, certain that some of the rudest tribes are acquainted with the general medicinal properties of many of their vegetables. Medicines of savages are in general medicines of an active kind. The Indians of North America are in possession of a number of active and important remedies. They do not always apply their remedies with judgment and discernment.

Volney reached his conclusions from observations of Indians of the Middle West, and his summary follows:

They are afflicted with diseases of the stomach, intermittent and bilious fevers, consumption, and pleurisy. Fractures and dislocations are not rare among them, but they are pretty dextrous in reducing them. They would suffer more from rheumatism if they did not practice fumigation by means of hot stones.

Schoepf's opinion of Indian medicine and practice was given in these words:

Most of the diseases for the healing of which the skill of the Indians is specially praised, are simple, those in which nature may work actively and effect most salutary changes. The observers and panegyrists of the so much belauded Indian methods of therepy are commonly ignorant people who find things and circumstances wonderful because they cannot offer explanations from general principles. The medicines of which they make use are few and simple, potent naturally or through the heaviness of the dose.

BUTTERNUT OR WHITE WALNUT

Indians cured many ailments with this tree's bark, and white men learned its use from them. Modern drugstores keep the bark for sale.

Indian doctors seldom compounded medicines. Each was complete in itself. If they used cherry bark, they mixed nothing with it; if dogwood flowers, they were used alone; if beech leaves, they alone were employed. The old medical books called such remedies "simples," because only one ingredient was present.

After the Indian came in contact with white men he speedily acquired most of the diseases of civilization, but while he lived in his natural environment his ailments were fewer in number. Judging from statements in old books dealing with the matter, Indians suffered chiefly from four classes of complaints, but the classification here given is not scientific.

The first may be defined as aches for which the Indian could discover no visible cause, such as rheumatism, toothache, and headache. There is no question that the savages suffered severely from these.

Fevers constituted the second class, and all accounts agree that Indians suffered from that cause. It may not be possible to diagnose the cases sufficiently to deter-

mine at this late date what kinds of fevers prevailed, but the old-fashioned "fever and ague" was common. It could not have been otherwise, for mosquitoes were swarming in the woods, and among them doubtless were numerous anopheles, the species which transmits the germs which cause ague. Naturally Indians would suffer greatly from the bites of these germ-carrying insects, and chills and fever would develop. Contemporary writers bear abundant testimony that malarial sickness was common among the Indians, and the red doctor knew what medicines the forest afforded for the cure of intermittent fevers.

Wounds constituted the third class of sickness calling for cures. The most usual wounds were cuts, bruises, sprains, fractures, burns, and frostbite. The savage's mode of life made these hurts of frequent occurrence.

The fourth class might be listed as a subclass of the third, but it was so common and so distinct that it properly stands separate from others. It was the wound caused by the bite of a poisonous snake. Every part of the United States was infested by venomous serpents, and the bare-legged savages, walking through weeds and among rocks, were peculiarly liable to attack. The Indian doctors ransacked the American forests for snakebite remedies, and no fewer than 35 separate cures, or alleged cures, were known and used, but not all in the same regions. All of these were derived from trees and herbs. Several plants known as "snake root" have come down to the present day. Two of the best known are "Virginia snake root" (*Aristolochia serpentaria*) and "Seneca snake root" (*Polygalia senega*). The Virginia snake root was so highly valued by the Cherokee Indians that they placed an embargo on its export, with the death penalty for any one attempting to carry the forbidden root out of the country.

COMMON ELDER

The bark was beaten to a pulp by Indian doctors and was applied as a poultice to relieve toothache. It was afterwards used extensively by civilized physicians. The bark contains hydrocyanic acid and is poisonous.

Quinine was unknown to the Indians who inhabited this country in early times, but they sought out the best obtainable substitutes for it and used them as medicines in treatment of fevers. Several native trees yielded bark, flowers, or fruit so bitter in taste that they filled the place of quinine. Some of those remedies were adopted by civilized physicians as treatment for intermittent fevers.

One of the most widely used fever medicines employed by the Indians was dogwood (*Cornus florida*). The tree grew in nearly all forested regions east of the Rocky Mountains, and other species very similar were found in some parts of the United States, so that Indians in widely separated regions could procure it. Flowers, fruit, and bark were steeped in water and were thus made into an intensely bitter drink which was administered in large doses. White physicians who learned the remedy from the savages used whiskey or gin as the fluid part of the medicine, and it has remained in use to the present day, though it is not so popular as it once was. It was the "bitters" formerly prescribed by many a country doctor for "fever and ague," just as the Indians administered it.

WHITE ASH TRUNK

From this bark the Indians manufactured one of their thirty-five recorded snakebite cures. Most ash lumber is cut from this species.

Yellow poplar (*Liriodendron tulipifera*) was as bitter as dogwood and Indians administered it for the same purpose. They preferred bark from the roots, but the inner bark of the trunk and even the green fruit, were given as a chill and fever remedy. The white man adopted that remedy from the Indians and occasionally he still employs it.

The angelica tree (*Aralia spinosa*) supplied a fever medicine which enriched the savage doctor's pharmacopoeia. The inner bark was used. It is less bitter than dogwood and yellow poplar, but it possesses a peculiar acrid taste which commended it to the barbarians; for the more disagreeable the taste, the greater virtue in the medicine, according to their opinion.

Greasewood (*Covillea tridentata*) was a medicine formerly in use among the Indians of the southwestern arid region of the United States. The leaves and twigs were boiled and the resulting tea was drunk. It is not very bitter and its efficiency as a fever medicine is doubtful. It is not a tree but a shrub. It is the purpose to restrict this article pretty closely to medicines derived

from trees; but it may be allowable to include this species of greasewood. It is one of a group of related species of which some of the western Indians made arrows, and in so doing they had their mouths constantly filled with the bark, because it was their custom to strip off the bark with their teeth from the young shoots in the process of arrow making. Small crooks in the stems were straightened by using the teeth as a vise. The arrow maker pronounced the bark "good medicine for the stomach," and that may have led to the use of greasewood tea as a medicine by those who felt the need of it. The Pima Indians were still using this remedy a few years ago.

Indians had as much toothache and rheumatism as the less barbarous people, and they suffered from headache, and had remedies for these and kindred pains. They were able to extract their own teeth by attaching a sinew or cord to the aching member, tying the other end to the limb of a tree, and allowing their weight to give the necessary pull. But they had cures without surgery.

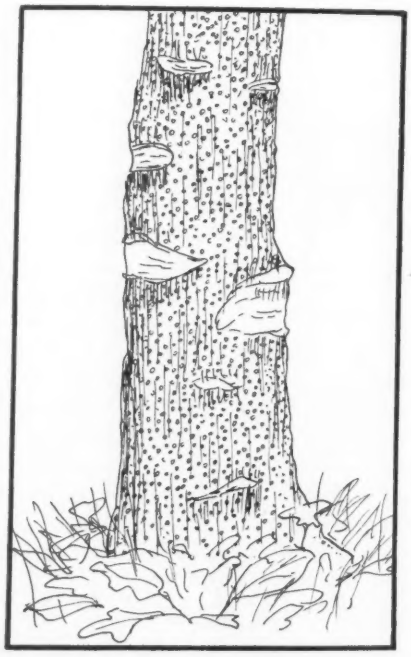
YELLOW POPLAR FRUIT

The savages of eastern United States made medicine of bark, buds, and fruit of yellow poplar or tulip tree, and white settlers learned its use from them. It was a fever remedy as well as an external application for sores.

Writing about the year **1794** Loskiel, a German traveler, said in his "History of the Missions of the United Brethren Among the Indians of North America" that the Indians applied the bark of the "toothache tree," or prickly ash, as a cure. That tree was the same as the angelica tree referred to above as a fever cure. It was also known as Hercules club, which name it still bears in some regions. There are two species known as toothache tree and Hercules club in this country; both of which were used as medicine by the Indians. The northern species to which Loskiel referred was *Aralia spinosa*. The southern species which is known by the same English and Indian names, is designated by botanists as *Xanthoxylum clava-hercules* and is wholly different from the northern tree which it so closely resembles.

Butternut (*Juglans cinera*) was another toothache remedy among the Indians, and was likewise employed to relieve headache and rheumatism. Loskiel refers to it in his book as follows, speaking of the savages which at that time inhabited Ohio and Pennsylvania:

For rheumatism some apply the bark of the white walnut to the part affected, by which the pain is frequently removed and an eruption produced in some parts of the body. It is extremely acrid and occasions a pungent pain on the part of the skin to which it is applied, which afterwards appears as if it had been scorched. For the headache they apply a small piece of the bark to the temples, and for the toothache on the cheek near the tooth affected.



UMBRELLA TREE

The bitter bark of the *Magnolia tripetela* (umbrella tree) was diligently sought by the red doctors as a cure for chills and fever. It was an article of commerce with them.

Butternut bark, and also the bark of the angelica tree, have been in use as medicine by regular physicians ever since the secret was learned from the Indian doctors, but no longer as toothache remedies.

The common elder (*Sambucus canadensis*) is still another addition to American medicine learned from the Indians. Peter Kalm said in **1749** of this elder as a toothache cure:

I have seen the Iroquois boil the inner bark and put it on that part of the cheek in which the pain was most violent. This, I am told, often diminishes the pain.

Early American doctors laid great stress on the elder as a source of medicine, and they used every part of it, flower, fruit, bark, root, and pith. Some parts of it are still for sale in drugstores, but elder does not enjoy the reputation it once had. Fortunately the Indians who suffered from toothache applied the elder bark to the outside of the cheek instead of the inside of the mouth, for elder bark is a deadly poison, due to the hydrocyanic acid it contains, and it has been known to cause death almost instantly when swallowed. Who knows how many Indians were fatally poisoned before they learned to apply the elder toothache remedy externally instead of internally? The Indian's usual treatment for rheumatism was a steam bath in an airtight hut; but he had remedies of other kinds, chiefly drinks made from bark and roots. One of the Indian's favorite cures for rheumatism and valued higher than probably any other tree, so far as it was known, was the umbrella tree (*Magnolia tripetela*). This is known also as cucumber tree, magnolia, and elkwood. It is found among the Appalachian Mountains of Pennsylvania and southward, and in some localities as far west as the Mississippi River. The grouping of the leaves on the outer ends of the branches, in the form of a parasol, gives the name "umbrella tree." In Dr. Barton's "Collections," published in **1798**, he speaks thus of the umbrella tree:

The bark of this tree is celebrated among the western Indians as a remedy in rheumatism and fevers. The tree grows in great profusion upon the River Kanhaway (Kanawha) whither the Indians resort for the purpose of procuring

the bark which they carry off in great abundance. It is known as elkbark and Indian bark.

Barton must have had in mind a period much earlier than his book, 1798. The Kanawha river is in West Virginia, and the Indians were driven from that region by Gen. Andrew Lewis in 1774, and they never returned. The bark-gathering expeditions spoken of must have belonged to a much earlier date. It is worthy of note, too, as a record of forest change, that though the umbrella tree may once have existed "in great profusion" in that region, it is difficult to find a single tree of that species in all that country at the present time. The report on the trees of West Virginia, prepared by A. B. Brooks for the state geological survey, makes no mention of this species, and it is presumed that it was not met with in the region where it was formerly abundant.

LEAF OF SLIPPERY ELM

No tree has a smoother inner bark and a rougher, harsher leaf than slippery elm. The bark was made into poultices by Indians. White settlers learned the art, and all drug stores sell the bark. The ground article is often adulterated with wheat flour.

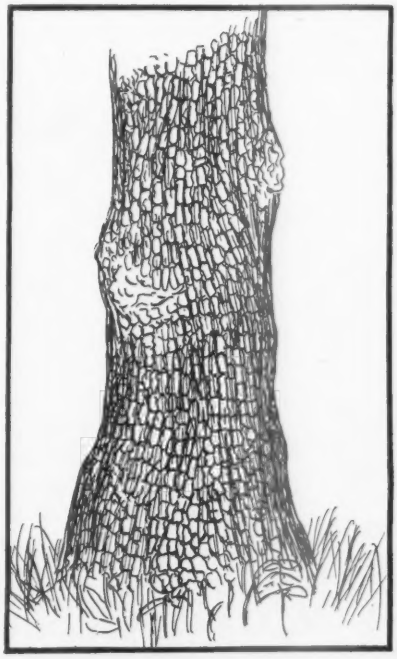
The Indians made an oil from hickory nuts and black walnuts and used it as a liniment "to supple their joints," according to the testimony of an old writer. That remedy was employed frequently by Indian fishermen who waded much in the water along the tidal rivers of Virginia and Maryland where half the savage population lived by fishing. Rheumatism and stiffening of the joints, due to exposure, were common complaints, and the frequent application of nut oil gave relief. It seems probable from early accounts that hickory trees were more plentiful than any other forest tree species in the Virginia coastal region at that time, which was the period of first exploration by white men. At that time the loblolly pine (*Pinus taeda*) was confined chiefly to tracts near the mouths of rivers and had not yet spread inland as it has since done, and hickory held chief place in the forest's makeup in that part of the country.

Most of the cures for snakebites, which the Indians made use of, were annual plants and therefore do not fall within the scope of this article which deals with trees only; but the white ash (*Fraxinus americana*) was employed as a remedy, according to Loskiel, who says in speaking of the bite of snakes: "A decoction of the buds or bark of white ash, taken inwardly, is said to be a certain remedy against the effect of this poison."

Indians of the Lake States and of parts of Canada placed much reliance on arborvitae (*Thuja occidentalis*) as a protection against snakes, though it does not appear that they actually applied it as a medicine. They went on the theory that an ounce of prevention is better than a pound of cure. It is written in volume 3 of the "Jesuit Relations":

> In the forests (of the Huron country) are seen abundance of cedars. The odor of the tree is disliked by serpents, and on this account its branches are used for their beds when on their journeys.

Arborvitae possesses a camphorlike odor which is very perceptible when the leaves and twigs are bruised. The present day camper in the country north of the Great Lakes is glad to furnish his camp bed with arborvitae boughs, which he calls "spruce feathers." The odor might have kept snakes out of the wigwams of the Huron Indians two hundred years ago in the palmy days of the Jesuit missionaries; but at the present day the camper regards the delicate odor as one of the luxuries of forest life, and it is that which now gives the boughs their value, and no one regards them as protection against serpents. In fact, it is doubtful if snakes shun this tree, for they hide in arborvitae hedges as readily as in any other hedge.



FLOWERING DOGWOOD

The bark of dogwood was the best substitute for quinine the Indians had. It was one of their remedies for chills and fever. White people long used bark, flowers, and fruit as fever medicine.

Indians had no infallible snakebite cure. An early traveler in Florida asked whether an Indian when struck by the large, black rattlesnakes of that region ever succumbed, and he received the answer: "I never knew of one so bitten that did not succumb." The blunt, thick rattlesnake of Arizona, known locally as the "sidewinder," is reputed to cause sure death when it strikes an Indian; but that point does not seem to have been investigated scientifically. So far as the writer of this has been able to ascertain from reports of the Bureau of Ethnology, the only case reported of an Indian bitten by a rattlesnake in Arizona was one that proved fatal, but it was assumed in that instance that death resulted because the victim was unable to apply a remedy promptly. Indians of Arizona and surrounding regions made themselves leggings of hard leather as a protection not only against snakes, but also against the fierce thorns which bristle on every leaf and stem

of the desert vegetation. Prevention was easier and safer than cure. To this day if an Indian of certain California tribes is bitten by a rattlesnake and cannot get aid from white people, he gives up to die, believing that there is no hope. Such a bite is not, however, necessarily fatal.

Cuts, bruises, sprains, burns, frostbites, and many other injuries of a like nature, were common among the Indians; and the trees of the forest furnished poultices, salves, and liniments in profusion. The bark of slippery elm (*Ulmus pubescens*) was as great a favorite among the savages as it was later and still is, with the civilized physician. All drug stores sell it; but long before there were drug stores in America, the red doctors understood the healing properties of this bark. John Lawson, who has been already quoted, wrote of this remedy as follows more than two hundred years ago:

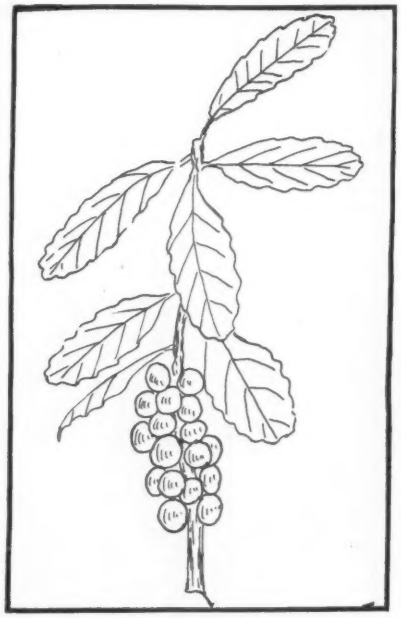
ANGELICA TREE

Indians called this the toothache tree (*Aralia spinosa*) and made poultices of its bark which served as a counter irritant in toothache. It was a fever medicine also.

> The Indians take the bark of its roots and beat it whilst green to a pulp and then dry it in the chimney where it becomes of a reddish color. This they use as a sovereign remedy to heal a cut or a green wound.

One hundred and forty years after Lawson's time, one of the foremost physicians of America, Dr. Wooster Beach, paid the following high compliment to elm bark, the use of which had been learned from Indian doctors:

> It quickly and powerfully allays inflammation, promotes resolution, also suppuration, and heals speedily. We make extensive use of the flour of the bark in the form of poultice, for every variety of inflammation, wounds, and ulcers. In point of utility, it is of far more value than its weight in gold; and, therefore, whoever has a tree on his farm should never permit it to be cut.



YAUPON HOLLY

The notorious "black drink" of the southern Indians and the Spaniards in Florida was brewed from the roasted leaves and twigs of yaupon holly. It was a remedy for anemia and was taken once a year.

Slippery elm is easily distinguished from the four other elms of this country by its thick mucilaginous inner bark, but its leaf assists frequently in identifying it. Its apex is usually longer and narrower than the apexes of the leaves of other elms, and the leaf feels rough and harsh, no matter in what direction it is rubbed. When the leaves are crushed in the hand they give a crackling sensation.

The fruit of yellow poplar, beaten, boiled, and made into salve, was an Indian remedy of which an early traveler wrote: "The buds, made into ointment, cure scalds, inflammations, and burns. I saw several bushels thereof."

Indian doctors were able to do more with the leaves of the common beech tree (*Fagus atropunicea*) than modern doctors are doing, for current dispensatories do not mention beech leaves. John Carver, who traveled on the headwaters of the Mississippi river at a time when the region was practically unknown to white men, thus wrote of the medicinal value of beech leaves in winter:

WILD CHERRY

This tree's bark furnished tonic to Northern Indians and was likewise employed in fevers. It is still considered valuable as a medicine.

> The leaves which are white, continue on the tree during the whole winter. A decoction made of them is a certain and expeditious cure for wounds which arise from burning or scalding, as well as a restoration for those members that are nipped by frost.

Beech is one of the few deciduous trees whose leaves remain on the twigs during the winter and they are thus preserved against decay. That fact probably suggested their use to the Indians.

The bark of white pine (*Pinus strobus*) was made into poultices for burns and other sores; and this remedy has come down to the present time, and this pine bark is still in the market. It runs high in tannin and resin.

The Indians administered tea made from the bark of sassafras roots, also from buds and flowers, as an internal remedy for wounds. The tea is in wide use yet, as a popular blood purifier, and is drunk in early spring by many a person who does not know that it is an Indian medicine handed down from past centuries.

Mesquite (*Prosopis juliflora*) supplied the great eye lotion for the Indians of the Southwest. The glare of the sun in that hot, arid region, is severe on the eyes and is apt to produce chronic inflammation of the lids. The

Indians concocted an eye wash from the mascerated leaves of mesquite by squeezing the juice through a cloth to rid it of solid particles. The eyelids were bathed in the liquid. The savages made use of the white inner bark of mesquite, beaten into powder and boiled, in preparing a medicine which they administered internally for a number of real or imaginary diseases.

The wild Indians had no such classic name as "anemia" for that "run-down feeling" which comes in the spring and early summer; but they had the malady and they had the remedies. In the North they drank tea made from wild cherry bark, and in the southern coastal region of the United States they imbibed enormous quantities of their famous "black drink" which they brewed from the leaves of yaupon holly (*Ilex vomitoria*). They journeyed from far inland to the Carolina coast to procure it. The roasted leaves, made ready for brewing, were an article of commerce between the coast Indians and those of the interior. One of the earliest and best descriptions of the brewing of the drink was published in 1716 by John Lawson. It follows:

SHELLBARK HICKORY

Oil made from hickory nuts was used as liniment by Indians to "supple their joints." Mayapples, also used as medicine by the savages, are seen growing near the base of the tree. This is the *Podophyllum pelatum* of the modern drugstore.

> Cattle and sheep delight in the plant very much, and so do the deer, all which crop it very short, and browse thereon whensoever they meet with it. This plant is the Indian tea, used and approved by all the savages on the coast of Carolina, and from them sent to the westward Indians and sold at a considerable price; all which cure after the same way as they do for themselves, which is thus: They take the plant (not only the leaves but the smaller twigs along with them) and bruise it in a mortar until it becomes blackish, the leaf being wholly defaced. Then they take it out and put it in one of their earthen pots, which is over the fire, until it smokes, stirring it all the time until it is cured. Others take it after it is bruised and put it in a bowl, into which they put live coals and cover them with yaupon till they have done smoking, after turning them over. After all, they spread it upon their mats and dry it in the sun and keep it for use. The Spaniards have the plant very plentiful on the coast of Florida and hold it in great esteem. Sometimes they cure it as the Indians do, or else beat it to a powder, so mix it as coffee; yet before they drink it they filter the same.

The yaupon drink was a violent emetic, and the Indians used to imbibe so long and in such amounts that they were scarcely able to walk, continuing the process during several days. They then departed for their homes, feeling certain that they had been fortified against disease for another year.

MARYLAND FORESTRY ASSOCIATION

THERE has been recently organized, along unique lines, a Forestry Association in Maryland. Forestry in Maryland, as a State activity, is nearly twelve years old, and during that time has made steady progress. Incident to this progress has been the enlisting of the support and active participation of an increasingly large number of people, which would naturally form the nucleus of a Forestry Association.

Membership is restricted to those who have rendered some definite service to Forestry in Maryland, and therefore constitutes an honor class. There are two classes of membership—Annual and Life. It is intended to make the Yearly Membership a distinction of merit, and of the Life Membership a mark of distinguished service. There are no limitations of age or sex, and no dues.

The objects and purposes of the Association are expressed in the published preamble:

"In beginning and organizing this honorary body, it is the intention and wish of its officers and the members already admitted to build up a great State body of men and women who have in the past been enough interested in these and kindred things to actually do something for them; and not only those who have already done something, but to encourage *doing* among those who may have the chance, or will find it, to extend efficient aid to forest protection, natural conservation, and rural, public benefits in Maryland. Initial plans for formation and membership, with by-laws, rules and regulations for the personnel, officers, and work of the Association have already been made, and the task of permanently forming this honorary body of 'forestry assistants' in Maryland will proceed at once.

"Officers of the first Maryland Forestry Association, all of whom firstly are members because of service rendered, and secondly officers because of ability to carry out the work, have been proposed as follows: For President, Hon. W. McCulloh Brown. For Vice-Presidents, Bernard N. Baker, Mrs. Austin Gallagher, Dr. H. J. Patterson. For Secretary, F. W. Besley. For the Board of Directors and Committee on Membership Qualifications, Robert Garrett, Dr. Edward B. Mathews, Dr. A. F. Woods, Miss Catherine Lurman and Richard Norris.

"Lists of the Life and Annual Members of the Maryland Forestry Association will be published annually or oftener."

RAPHAEL ZON, of the United States Forest Service, has been appointed a member of the Executive Committee of the Division of Agriculture and Forestry in the Natural Research Council. Mr. Zon and Dr. I. W. Bailey, of Harvard, will represent the forestry interests of the country.

THE FALL OF RHODE ISLAND'S MONARCH PINE

BY JESSE B. MOWRY

THE GREAT WHITE PINE

For many years the pride and boast of Rhode Island. Strangely enough, it fell in March, in the year of "falling monarchs."

SOMETIME near the first of March, the great White Pine, at Spring Grove, one of the chief attractions at that summer resort, fell with a mighty crash—victim to a southwest gale—destroying surrounding timber and startling wild life in the vicinity. So far as I know, it was the largest White Pine on earth, and was owned by Andrew J. Steere, of Chepachet, whose father, one hundred years ago, was offered $100 for the tree to make a big mill shaft.

So great was the general interest in this veteran of the woods that several years ago the following letter, giving dimension measurements and other information, was published in the Pascoag *Herald:*

"In response to inquires which from time to time come from far and near relative to the White Pine standing near Spring Grove, its measure was taken with forest instruments on this date. Diameter, breast high, 45 inches; circumference, breast high, 12 feet; total height, 111 feet; merchantable log length, 85 feet; contents of the trunk, 500 cubic feet equal to 3000 board feet more or less. For trees of its class, it has a quick taper. Its age no man can now tell. The Maine Log Rule for edged inch boards and one-quarter inch saw kerf gives the yield of its 12-foot butt log, 1,051 board feet.

"This tree stands in a ravine near the border line between two well known types of soil—the Alton stony loam and the Glocester stony loam. A rivulet running through the gravel near its roots emits a strange gurgling sound. This year it produced a large quantity of seed eaten by that testy little shade-tail—the red squirrel. This is one of the largest trees of the species in North America today, and the few remaining veterans of the forest primeval will soon be gone and gone forever.

"Several years ago a White Pine cut in Pennsylvania was 351 years old. Its diameter breast high was 42 inches; total height, 155 feet; length of log used, 114 feet; total volume of stem 574 cubic feet which scaled 3,335 feet of merchantable lumber.

"Some of the log rules in use make such large discounts for waste in milling and defect in logs that they fall far short of the mill tallies for single sound logs. But for native pine logs less than 20 feet long the Maine rule is fairly accurate, having been carefully tested many times at the saw. Sawyers not familiar with the methods of constructing log rules sometimes think the rule inaccurate because it does not happen to agree with the actual cut of some particular log—for example—a cut of 310 feet from a 12-foot log of 23 inch top diameter, for which the Maine rule gives 300 feet. But the average cut from 10 or more fairly straight sound logs of those dimensions would prove the general correctness of the rule.

"The cut of logs of the same dimensions is varied by many factors such as thickness of saw, thickness of boards, thickness of sawyer, waste in slabbing, trueness in set-up, defects in logs, rate of taper, shrinkage, etc."

A SQUARE MILE OF LAND FOR THE ASKING

THE 640-ACRE STOCK RAISING HOMESTEAD LAW. ITS OPPORTUNITY FOR THE LAND HUNGRY

BY WILL C. BARNES

THE final act in the fifty-year-old policy of the Federal government, to give free to every citizen a certain part of the public domain upon which to make a home, was brought to a close and "finis" written large upon it when Congress at its last session passed what is known as the "640-acre Stock Raising Homestead Law."

Originally there were more than two billion acres of land in the area covered by Continental United States, but now there remains of this huge tract but a scant two hundred and thirty million acres; a mere remnant which has been picked and culled over for more than fifty years by millions of settlers until, when compared with the fertile lands that the pioneers of as late as twenty-five years ago found, in the great Mississippi Valley, it is hardly worth the taking. Ten years more and the public domain will be a matter of past history. Senator Teller of Colorado once put it very tersely when he remarked that most of this residue "was fit only to hold the rest of the country together."

WHEN THE LAW FAILED TO PROTECT

Thousands of so-called "homesteads" like this were located in the midst of immensely valuable timber.

The first homestead law which began this home builders' plan of the government was passed in 1862. The end of the Civil War set free from military duty a large number of men whose army experience had made them restless and inclined to seek new fields of adventure. The country west of the Mississippi was then practically a wilderness full of Indians, romance, and excitement, and to it they turned by thousands, deserting their former farm homes for the more fertile plains of the west.

A few years later came the pre-emption law, which practically sold to each citizen an additional 160 acres at the minimum price of $1.25 per acre. Then came the timber culture act, by means of which any one could secure 160 acres by simply planting trees upon a portion of it. Theoretically this law was a great proposition for turning the treeless prairies of the middle west into forests, but practically it did nothing of the kind and through its operation the government was separated from many an acre of good land.

Congress then had another liberal fit and the "Desert Land Law" of 1877 was added to the list. By this each citizen could secure title to 640 acres more of land "upon which crops could not be raised except by irrigation."

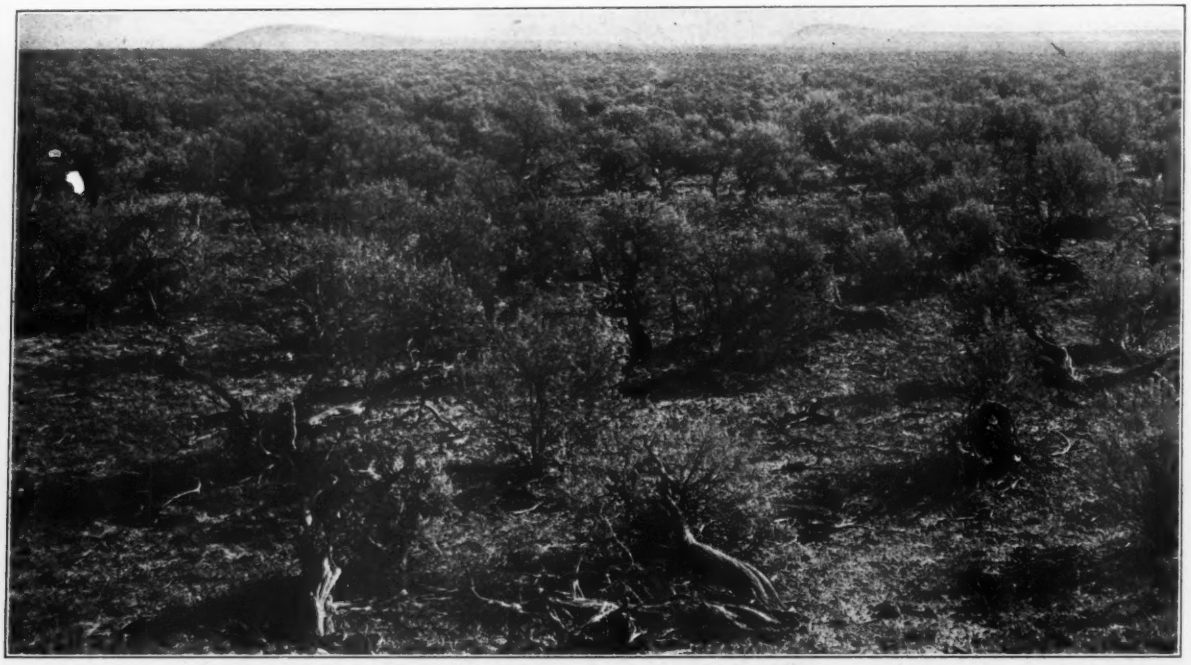
The frauds which were perpetrated under this act, and the way truth—and the water—was man-handled in gaining possession of lands under it would make Ananias himself blush.

A year later, in 1878, Congress passed the "Stone and Timber" act under which almost any citizen could select 160 acres of land, "chiefly valuable for stone or timber," and obtain title to it by paying the magnificent sum of $2.50 an acre, receiving in return timbered lands worth a hundred times the fee. There may be a record in the land office to show that somebody once took up a piece of land under the law for the stone upon it but mostly it was used to accumulate millions of acres of valuable timber land, especially on the Pacific Coast. Once a noted timber speculator brought to Oregon a solid trainload of people from his home town, each of whom located a tract of land under this law, paid the fees and price per acre, presumably furnished by the interested party, returned immediately to their eastern homes and, when title to the land was received from the government it was promptly turned over to the aforesaid speculator for some relatively small sum. Nor was there anything in such a performance that violated any federal statute; the law itself was easy, that was all.

Thus it was that not many years ago a single citizen of the United States could obtain legal title to no less than 1,120 acres of public land without any very heavy expenditure of cash, although many a one must have been afraid to look up the word "perjury" in the dictionary.

Then there came a mild reaction. First the preemption law was repealed, then the Timber culture law was cut out, and later the Desert land act was reduced to 320 acres and its requirements made much more rigid. Also there was a general tightening up of the administration of the land laws in the general land office. Naturally all these years it was a question of "first come, first served," until the late comers found the best of the lands gone and the remnant of mighty small value.

Then Congress to stimulate the settlement of the remainder passed the "Enlarged homestead bill" which "raised the ante" on the original homestead law from 160 to 320 acres, the idea being to make up by quantity what the lands lacked in quality.



THE LAND, WHICH MUST BE IRRIGATED

Six hundred and forty acres of this sage brush will not graze many cattle, but with water on it, the homesteader can raise four or five tons of alfalfa to the acre.

Just about that time the new born "dry farming" movement began to develop in the arid land states and so the public domain was once more culled over and over until lands that once seemed absolutely hopeless from an agricultural standpoint, were located by the land hungry people and thousands of acres were ploughed up, bringing in many instances only a glorious crop of Russian thistles.

The reader will no doubt recall that about six or eight years ago there was a dreadful outcry over the exodus of American citizens to Canada in search of homes. The federal government was soundly berated for allowing this to happen, the berators alleging there were millions of acres of land suitable for agricultural development in the National Forests which should be opened for entry and thus stop the migration. These people believed they were sure of their facts but were hopelessly ignorant of the real situation in the forests. The facts of the case were, that no such areas existed in the forests and if they did they were open to entry under a law passed by Congress expressly for that purpose. The painful truth about the public domain was that due to the activities of the homesteaders the government had parted with about all of its best lands and we had no such virgin acres to offer the new comers as did Canada where thousands of acres were open to settlement that were fully equal in value to the best we ever owned. We had had our little fling on public lands, now Canada was having hers. You can't eat your cake and keep it too, is as true of a nation as an individual.

But, during these years the Canadian government was coaxing our citizens across the border, the land officers on this side the line were doing a pretty good business, for in the ten leading public domain states of Arizona, California, Colorado, Idaho, Montana, New Mexico, Oregon, Utah, Washington, and Wyoming, more than 125 million acres of public lands were taken up under the several land laws from 1910 to 1917, inclusive.

	Original Area of State In Million Acres	Land Left for Entry July 1, 1917, In Million Acres
Arizona	73	22
California	101	20
Colorado	66	10
Idaho	53	14
Montana	94	12
New Mexico	78	21
Oregon	61	14
Utah	52	32
Washington	43	1
Wyoming	62	27
Totals	683	173

This shows Montana alone has given up more than thirty million acres of her lands to new settlers in the last eight years, and of her once vast open ranges amounting originally to over 94 million acres, there is left for future residents but 12 million acres.

New Mexico lost to the new comers in the same time over eighteen million acres and of her original 78 million she now has but 21 million left. New Mexico, by the way, is the fourth state in the Union in size, Texas of course being at the head, but that state has no public lands, they having all been retained by her when admitted to the Union.

Washington State which originally had 43 million acres of public lands, has been so well covered by the homesteaders that she is practically out of the list of public land states, having a scant million acres left, most of which is of little real value.

So in spite of all the talk of the "Canadian hegira" the public land states of the Union have recently furnished

THE CATTLE, WHICH MUST BE CARED FOR

It will take a mighty good section of grazing land to supply the needs of this little bunch of cattle the year round, and the homesteader must find it.

a very fair number of homes for the people of this country.

But this immense acreage taken from the public domain still further reduced the value of what was left for future settlers. So Congress again "raised the ante" and after two years of discussion the "640 acre Stock Raising Homestead Law" was the result.

In this new law the fact was recognized that the remnant left was of comparatively small value for ordinary farming, but that it had possibilities for stockraising purposes

Passing over the big question of whether or not any man eastern or western, can make a living and support a family on 640 acres of purely grazing land such as goes under that name in the western range states, and also the equally live question as to how many men who secure land under this law will remain on it a single day after their title has been handed to them by the government, let us analyze the requirements of this law and see just what it offers the new settler and incidentally some of the older ones; for it gives both a chance.

Under its provisions any citizen who has not already secured a home under the land laws can take up 640 acres of public land which is—to follow the definition in the law itself—"chiefly valuable for grazing and raising forage crops, does not contain merchantable timber, are not susceptible of irrigation from any known source of water supply, and are of such a character that 640 acres are reasonably required for the support of a family." These are the exact words of the law.

Some of these phrases are going to call for very fine definitions at the hands of the Secretary of the Interior. "Chiefly valuable for grazing and raising forage crops" for example, might well be said of a farm in Iowa part of which is in pasture.

Already the department has ruled that "Merchantable timber" means timber not in excess of 500 feet to the acre, a reasonable enough limitation.

But who shall say what acreage of land, good or bad, farm or grazing, may be "reasonably required for the support of a family?" Will it be a Rooseveltian family; must the family ride to school in a Ford or walk? From a rather intimate personal acquaintance with the values of what is left of our public domain I am certain that very few heads of families who take up lands under this new law will need to worry over the payment of the income tax, no matter to what point the necessities of the war may reduce the amount to be taxed.

Not only does the law allow a brand new entryman to secure his 640 acres of grazing land, but the way is opened to those who have already sat at Uncle Sam's

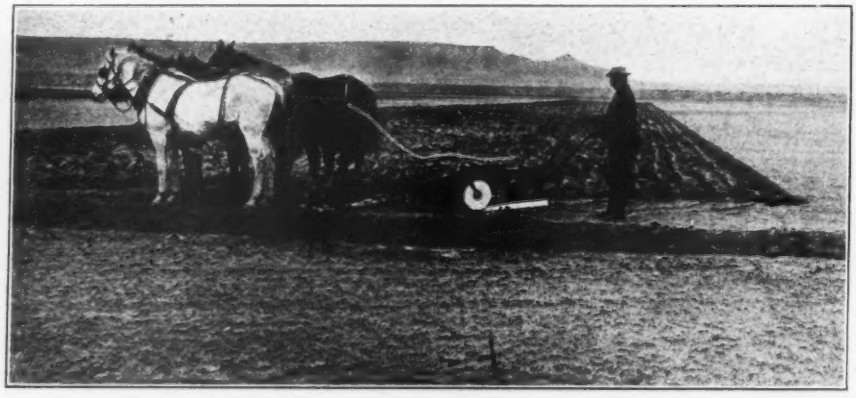
bountiful table to increase their holdings up to a full 640 acres.

Listen. If you have already taken up under the homestead laws 160 acres of land "of the same character" as the 640 acre law describes, you may, under this law, add to your acreage enough more to make a total of 640 acres, and what's better yet you can look for it anywhere within a radius of twenty miles from your original location. This additional land you do not have to live upon, but instead of residence and cultivation you are to place upon it improvements to the value of $1.25 an acre, one-half of which must be placed there within the first three years after entry.

WHERE NERVE AND DETERMINATION MEAN SUCCESS
This is a typical dry farm homestead in the dry farming region.

Perhaps you have already secured we will say, 320 acres such as the law describes, the title to which has passed from the government to you and there is no land within this twenty miles limit on which you can file to make up a full 640 acres. Very good. Section 6 of the law makes especial provision for this by giving you the right to relinquish to the United States your 320 acres—if you haven't plastered it with a mortgage—and then if you can find 640 acres of the right kind of land anywhere "within the limits of the land office district in which the entryman lives," you can begin all over again and file on the new tract of 640 acres.

Moreover, any one entitled to make additional entry under any of the provisions of this law is a preferred applicant to the land immediately adjoining his original homestead entry for ninety days after the land is designated for entry under the law.



A TYPICAL HOMESTEAD SCENE
This shows a settler hard at work, breaking up the sod on a new homestead in the "land of promise."

Residence upon the original 640 acre tract must be in accordance with all the provisions of the homestead laws, which is three years, but, instead of cultivation—for the land is presumed to be fit only for grazing purposes—the entryman must prove that he has expended on the land the required $1.25 per acre.

If you build a thousand dollar house on the place, its cost does not go to the credit of this $1.25 an acre for the improvements must be in the nature of stock raising improvements and a house for the dweller and his family to live in is of no value to the stock—so the land office says.

A well, corrals, fencing and such improvements will, however, meet the requirements of the law—so the land office again says.

The instant the bill passed letters poured into every western land office seeking further information as to the law, where the lands lay, and how soon they could be filed on. To facilitate reply to these inquiries the land office issued a circular ("Circular 523 General Land Office") giving all available information as to the law and the rulings upon it to date. Every prospective settler should secure a copy of this before taking any steps to locate land.

There is so much left to the imagination of the settler that a word of caution should be given to those who fondly imagine that all they have to do to secure 640 acres of this land, is to go to some western state and grab one of these mile square pieces of the public domain the instant they step from the train.

There are a lot of mighty cogent reasons why this cannot be done, the principal one being that ever since the 640 law was introduced in Congress every wide-awake western citizen—and there are several of them—has had his eye on a tract suitable for entry. Just the instant the bill passed these early birds got busy and took advantage of a little joker in the law which allows properly qualified persons to select a tract of land for entry without waiting for its formal classification, notify the land office of its location, pay the fees and commissions and sit tight in the knowledge that you have first claim on the land over all comers for ninety days after it had been classified and thrown open to entry. Within three months after this law was passed and before a single acre of land had been classified over fifty thousand individuals had filed such a preliminary

statement with the land offices, covering over twenty million acres, the fees for which amounted to over two million dollars, and they are still pouring in.

Many western men honestly believe the government is wrong in tempting its citizens to try to do the impossible by dangling in their faces this idea of quantity rather than quality.

Few people outside of those living in the region will ever appreciate the trials and hardships which the dry farmers are today experiencing in their endeavors to make a home under the conditions that maintain in the arid states. On a fair average a tract of 640 acres of the class of land this stock raising law covers, cannot possibly furnish feed for more than twenty-five head of cattle for a full twelve months and with this number as the sole basis of a living, the man who undertakes the job of carving a homestead out of such raw materials is facing a situation that will test his staying qualities to the uttermost limits.

Take the single question of water for either stock or domestic purposes. Practically all the lands that will be opened for this law have no surface water and most of them lie in regions where well digging is either hopeless or the expense prohibitive.

An ordinary deep well, equipped with windmill or gasoline power costs all the way from $1,000 to $2,500, according to the depth and there is absolutely no assurance that water will be found when the well is dug.

Many years ago when the Texas Pan Handle was first being brought under the domain of the dry farmer,—"Kafir Korners" they were called locally—several of us were driving across the prairie near where the present city of Amarillo now stands.

We turned out of the road to make way for a mangy team of ex-cow ponies, mostly with rope harness, pulling a rickety wagon on which were several barrels of water, a fact established by the splashing of the liquid at every bump in the road, of which there were many. The driver stopped to ask for a light for his corn cob pipe. We plied him with questions. "How far do you have to haul water?" "'Bout eight mile," he puffed vigorously. "Was that your claim we passed about two miles back?" was our next inqury. "Yep." He was too hungry for a smoke to waste words. "Why don't you dig a well and save hauling water so far?" We were getting interested in the subject. He gathered up the rope reins. "Stranger," his voice was full of reproach, almost sarcastic in its tone, "stranger, I reckin' you ain't got much idee about well diggin' in these yere parts or you'd know 'twas jist about as fur to dig as to haul an' while I'm haulin' water them there ponies is a doin' all the work. Giddap Bill—drag it, you Sam."

Of the 230 million acres of public lands still left, it is difficult to say just how much of it will be found suitable for entry under this law. If the classification work is done liberally; if such areas are opened as the open plains country east of Denver or the eastern half of the state of Wyoming or what is left of the public lands in eastern Montana, it will not be difficult to classify over a hundred million for entry. On the other hand if it is done critically and held down to such areas as will actually support a family on 640 acres of straight grazing land there will, in the judgment of most western men, be precious little of it, perhaps not over 20 million acres.

Whatever the acreage, however, it will play havoc with the western range livestock industry, during the period of entry and occupation by the settlers. Then, as titles begin to pass to the settlers it will go in large blocks into the hands of big corporations, live stock companies and individuals and eventually be again used for producing range stock. Also it will find its way onto the tax rolls of the several states, which will not be an unmixed blessing. But for at least ten years to come the live stock business of the western range states will be very decidedly up in the air.

Already western stockmen are alarmed at the prospect and the Secretary of the Interior is being deluged with appeals to ask the President to postpone the taking of effect of the law for two or three years, claiming the breaking up of the ranges will force onto the markets of the east approximately five million head of sheep and cattle, mostly sheep, that are now using these lands for grazing purposes. The legislature of Idaho recently passed a resolution to this effect, and called upon Congress to repeal the law and save the wool growing industry of the Nation from approaching ruin. There is, of course, much merit in these statements, but it is very doubtful if Congress will repeal the law and still less likely the President will interfere to stop its operation, granting he has such authority, which is questionable.

Many well posted men feel this law is a great economic mistake, believing these lands should be held forever as public grazing grounds to be administered by the federal government as such. The interesting point to the whole matter is that for years the conservationists of the United States have been fighting hard to have these lands so reserved and administered, but the sheep interests of the west opposed it by every means in their power and managed for twelve years to block the passage of the law every time it came up in Congress. Now that it is too late and they see their ranges about to be broken up and dissipated and the western range wool industry ruined, they realize their mistake all too late and would be only too glad to see a law passed that would put all of these remaining public lands under some form of government control similar in character to the present control of the grazing lands in the National Forests, which has been the salvation of the range stock interests of the west, a fact now freely admitted by its former most bitter enemies.

Meantime, to those citizens who do not live in one of the public land states and are figuring on going west to secure 640 acres of free public land under this new law, let me say, as did Puck to the man about to be married: "DON'T"— for the present at least.

If, however, you really can't be happy without some of this cheap land, wait until the classification is completed

and the land is opened for entry. Then go west to some point where a large body of it lies and let it be known in some little town nearby that you are in the market for a "relinquishment" of a 640 acre tract. (Memo.—Safety first. After letting this fact be known "watch your step" lest you be hurt in the rush of would be sellers.)

A relinquishment, be it known, is a document by means of which an entryman, tired of his bargain, can reconvey to the United States his entered land without prejudice to any further entries he may wish to make elsewhere.

Ordinarily you will secure a relinquishment, which carries with it, of course, all improvements your predecessor has placed upon the land, for just about one-third of what they cost him. (Memo.—Don't be in a hurry to buy, take your time and choose the one that suits you best.)

Armed with this relinquishment, you can go to the Land office and the same clerk that notes the relinquishment on the plat books of the office, will record your entry for the land reconveyed by it. Then, if you have in you the stuff of which pioneers are made, and are determined to succeed no matter how hard the way may seem, you have a fighting chance to make good.

THE PROVIDENCE OF SOME PIONEERS

BY AVIS GORDON VESTAL

IF credit is due to a man who makes two blades of grass grow where but one was grown before what shall be the reward of the thrifty pioneer who has been provident toward his own old age or the legacy of his grand children by planting scores of sturdy walnut trees? On a motor trip through Illinois, last summer, the writer came upon a splendid hedge of tall walnut trees, about

A HEDGE OF WALNUTS LINING THE ROAD

An investment of thought and effort some years ago shows its result in these splendid trees today.

eight miles north of Quincy. There must have been hundreds of these valuable trees, for they stretched far along the road and turned at right angles at the corner to border a side road. Within a few minutes' ride further we passed another similar walnut grove set like soldiers going single file.

TREE ON STILTS

THIS elm tree is about 200 years old, and is situated on the Delaware River, near Phillipsburg, New Jersey. The rushing waters of the Delaware in the spring freshets have carried the soil away until the great tree was left on stilts as the picture shows, yet it is still able to stand the mighty force of the storm and has baffled it in this way for about seventy years. The oldest residents in the neighborhood say the tree was on stilts

A CASE OF THE SURVIVAL OF THE FITTEST

With roots exposed to a depth of more than ten feet, the right of this sturdy old elm to claim fitness cannot be denied.

when they were small boys. The exposed roots cover a space of about 12 x 15 feet. Some of the roots are fifteen inches in diameter and ten feet long, the tree having two main stems—one about thirty-two inches thick and the other twenty-four inches in thickness.

THE OWLS

(Families Strigidae and Aluconidae)

BY A. A. ALLEN, PH.D.

ASSISTANT PROFESSOR OF ORNITHOLOGY, CORNELL UNIVERSITY

THERE is something irresistible about an owl. The killing of one creates an excitement like the catching of a horsethief or the hanging of a criminal, and even a dead one draws a crowd. Never is an owl allowed to die a peaceful death, or once dead, to return to dust in the natural way. It must be filled with tow and posed on a root and two great glass eyes must be stuck in its forehead. No shop, no saloon, not even the private home seems complete without its stuffed owl. A morbid charm attaches to the bird, because it hides during the day and comes out at night when evil deeds are perpetrated. The call of an owl is a sign of approaching death and one must be quick to turn his pockets inside out in order to save his life or that of some one dear to him. This and many other superstitions cling to the poor innocuous bird that sometimes approaches our dwellings to rid the garden of mice and rats.

A MAGNIFICENT THIEF

About the poultry or game farm, the great-horned owl is a bird to be feared and persistently trapped, but elsewhere he is too magnificent and beneficial a bird to warrant wholesale destruction. This is a captive specimen, trapped at a game farm where it was stealing pheasants.

There are over 300 species and sub-species of owls in the world of which only nine are found in North America, but some species occur everywhere, from the Arctic to the Antarctic, with the exception of a few islands. Some species, notably the short-eared owl, are nearly cosmopolitan in their distribution but the majority, if not local, show such range of variation in different localities as to be separately named. Thus the Great Horned Owl in North America is divided into eight different races and the screech owls into nine.

In size owls vary from the elf owl of our Southwest, not much larger than a sparrow, or about six inches long, to the great gray owl of Northern Canada that measures 27 inches in length and fully five feet from tip to tip of its wings.

In color and also in form, owls are very much alike so that no one has any difficulty in recognizing owls as such at sight. The predominating colors are browns and grays though some species are distinctly yellowish, others reddish brown, and the snowy owl, of the far north, largely white. As in color, they are also distinctly similar in habit. They hide during the day in hollow trees or against the trunk, and the more they resemble the bark or dead wood, the less likely are they to be disturbed. So we find that the woodland owls, which group includes most species, are mottled, streaked and barred with various shades of brown and gray. To further add to the camouflage, the heads of a number of species are adorned with tufts of feathers called horns or ears, which give them a jagged contour and render the protective coloration the more effective. The short-eared owls that live in the marshes are yellow and more striped like the dead vegetation, the burrowing owls are more sandy, like the soil, and the snowy owls, belonging to the frozen north, are much whiter than the average. Otherwise there is remarkable uniformity of color in all the species.

All owls are carnivorous and have sharp talons and strongly hooked bills. In this respect they are very similar to the hawks. Indeed, until recent years, because of their superficial resemblance a close relationship be-

tween the two groups was thought to exist, but it is now believed by most ornithologists that the similarity has been brought about by like feeding habits and that they are in reality, quite widely separated groups, the owls being more closely related to the nighthawks and whip-poor-wills. One of the numerous anatomical differences between the hawks and the owls, is that the owls have their eyes set immovably in their sockets and at the front of the skull, so that both are directed forward. For this reason, an owl has to turn its head in the direction in which it wishes to look. Owl's eyes are unusually large so as to admit as much light as possible during their nocturnal activities.

THE SMALLEST OF OUR EASTERN OWLS

A captive saw-whet owl. This species is either tame or stupid and often allows itself to be captured in the hand. It is shorter than a robin but the pigmy and elf owls of the Southwest are still smaller.

It is commonly believed that owls cannot see during the day. On the contrary, they see very well, for the iris can be drawn very close until scarcely more light enters than would with the normal aperture at dusk. The belief probably originated in the tameness or stupidity of some species which permit themselves to be captured during the day. On the other hand, certain species, like the hawk owl and snowy owl, regularly hunt by day and other species, like the short-eared and great horned, hunt on dark days when they have young to feed.

Owls are not dependent upon their eyes solely for hunting or escaping enemies, for their hearing is extremely acute. The disks of stiff radiating feathers about the eyes, that give owls their strange human expression, have the function of protecting the opening of the ear. The tufts of feathers, sometimes called "ears," that adorn the heads of many species have nothing to do with true ears. In most birds the ears open through small apertures, covered and protected by somewhat stiffened, modified feathers, below and behind the eye. No external ear is present. With the owls, however, although the canal leading to the internal ear is not relatively much larger, there is a true external ear in the form of a fold of skin and an underlying groove which extends from above the eye, around the side of the facial disk to below the bill. The facial disk protects the front edge of the ear and several rows of somewhat curled feathers the rear edge, but so closely appressed are they normally, that one might never suspect the presence of large ears. It is probable that hearing plays a very important part in the owl's pursuit of prey.

Another peculiarity of the owls in which they differ from all hawks except the osprey, is that two toes are normally placed in front and two behind. The outer toe, however, is opposable and can be brought around to the front. In the majority of species, the feathers extend down the legs and toes to the talons.

The feathers of owls even those of the wings are extremely soft, so that they make very little noise in flying. The Indian name for the owl, "hush wing" refers to this and the silence of their flight is almost proverbial. This permits them to fly through the woods or low over the meadow without frightening the small rodents upon which they feed.

A FORMIDABLE LINE OF DEFENSE

And one that would strike terror to the heart of almost any photographer, whose worst crime was merely a desire to secure a good picture of these defiant young long-eared owls.

Since most small animals

are nocturnal and most birds diurnal, the chief food of the owl is small mammals and birds suffer relatively little. Extensive studies of the food of owls made by the United States Biological Survey have shown a very small percentage of birds or poultry in the food of any species, the great horned, excepted. They are, therefore, among the most beneficial birds that we have, for it is absolutely necessary that some check be placed upon small rodents.

Take the meadow mouse as an example. This little animal has from five to eight young in a litter and from three to six litters a year, or from 15 to 50 young annually. If the number of young each year were only 15 and they should go unchecked for a time, at the end of five years there would be over 75,000 offspring from each pair. It is not necessary for each one of these small rodents to do much damage for the aggregate to be unbearable. The destruction which a normal number sometimes do to young fruit trees or to grain in the stack often amounts to thousands of dollars. Where unusual numbers assemble because of an abundant food supply or successful reproduction, the damage done is stupendous. In Australia, during the present war, when it was necessary to store grain in the open or on wharves, the rats and mice gnawed the sacks, and what was not lost by their eating or spilling was so defiled that the loss amounted very quickly to thousands of dollars. Every year in the United States, according to estimates made by the Biological Survey, the loss due to prairie dogs, ground squirrels, pocket gophers, jack rabbits, meadow mice and pine mice amounts to over 150 million dollars. House rats and house mice account for another loss of over 200 million, not including the loss by human disease transmitted by these pests. In these days when the maintenance and increase of the food supply is so important, the value of owls, these rodent destroying machines, cannot be over-emphasized.

MOTHER NATURE'S MOUSE TRAP

The short-eared owls are migratory and always appear in flocks where meadow mice have become unusually abundant. They remain until the mice get scarce. Nature has taken this way of preventing plagues of the prolific little rodents. This is a wounded short-eared owl.

It is not difficult to prove to one's satisfaction what the local owls are feeding upon. All owls have the habit of swallowing their quarry, unless it be very large, entire, fur, bones, feathers, and all. If very large, it is torn into a few pieces and these are swallowed. The stomach digests out the flesh, rolls up the bones and fur into neat oval packets, and the bird then disgorges these in the form of pellets. Anyone familiar with the places where owls roost knows of these pellets. An examination of them as shown in the accompanying photograph, shows a large percentage, if not the entire food, to be small rodents.

The migratory movements of some owls make them the more efficient protectors of our crops for they move from place to place, seeking abundant food. Particularly is this true of the short-eared owl for every time that meadow mice become unusually abundant in a locality and threaten to become a great pest, a flight of these owls usually follows. They remain in the infested

BROTHERS AND SISTERS BUT NO TWO ALIKE

Owls are birds of character and they show it from infancy. Each one of these young screech owls has his own opinion of the photographer.

area, nesting if need be, until the rodents once again become scarce, when they move on to another region.

The common prejudice against owls is due largely to superstition and to the destruction that is occasionally wrought about the poultry yard by the great horned species. This magnificent but dangerous bird can carry off full grown fowls and has been known to nip the heads from full grown turkeys. It sometimes kills for the mere joy of killing, destroying many fowls during a single night. On poultry and game farms, it is a bird to be feared and persistently trapped, but in the woods, where rabbits and mice and weasels are plentiful, it is far more beneficial than destructive.

Another large owl often confused with the great horned owl under the common appellation of "hoot owl" is the barred owl. It is nearly as large as the great horned but it does not have the "horns" on the head and has none of the yellowish brown in its plumage characteristic of the great horned. The plumage is distinctly barred rather than mottled. The calls of both birds are hoots that can be heard for a half a mile or more. The ordinary call of the barred owl can be distinguished by its ending in a descending nasal inflection, thus:

whoo—whoo—whoo who—whoo—to—whoo—ah

while the great horned owl's would be written:

whoo, hoo—hoo—hoo, whooo, whooo.

Both species, however, give other calls occasionally.

The snowy owl is somewhat larger than either of these owls and is uniformly white, lightly barred with brown. It spends the summer from central Mackenzie and Alaska northward and in winter, from the Arctic shores southward, sometimes as far as northern United States or even rarely as far south as Texas and Louisiana. Their southern migrations depend largely upon the abundance of rabbits and lemmings in the north. When these fail, which is usually once in ten years, considerable numbers of these owls reach the United States. Such an instance occurred during the past winter.

The long-eared owl resembles the great horned in having ear tufts but it is much smaller and more slender and does not have the white throat patch. It is usually found in evergreen thickets during the day and except during the nesting season, all the owls of the vicinity may resort to one such thicket to roost. Sometimes the roost is in a single thick cedar tree.

A HOME IN A HOLLOW TREE

Most owls nest in cavities in trees, although when these are not available they use old crows' nests. This is a mother screech owl brooding her young. Having six husky youngsters, she could not brood them all at once. The cavity was originally made by a flicker and the opening can be seen above and to the right. The side of the cavity was removed and later replaced by the photographer.

The short-eared owl is found only about grassy marshes or pastures. Like its long-eared relative, numbers of them spend the day together, usually on the ground, on tussocks or fallen logs in tangled places, where they will allow one to approach very closely before flushing. They then rise silently and fly off a short distance to drop noiselessly back into the tall grasses.

The commonest owl of all is the little screech owl, not much larger than a robin but much heavier since but little of its length is given up to bill or tail. It is found even in the heart of large cities in hollows of trees or in crevices about buildings, for the mice upon which it feeds are everywhere. It is represented by one or another of its nine races in all parts of North America. In color it varies from grayish brown to brownish red, the different colors having no bearing upon age, sex or season. This unusual phenomenon is known as dimorphism and has never been satisfactorily explained. Like the great horned and long-eared owls, it has conspicuous ear tufts but it is easily distinguished by its small size. When seen during the twilight when it starts on the night's hunting, the ear tufts are frequently laid so far back as to be indistinguishable, and the head looks as round as in the

saw-whet owl. The note of the screech owl, very far from being a screech, is a low tremulous whistle, sometimes almost a wail.

The saw-whet or Acadian owl is the smallest of the owls found in Eastern United States, being only eight inches long. It is usually found during the day in evergreen thickets, thorn bushes, or other thick places, and frequently is so tame or sleeps so soundly as to allow itself to be taken in the hand.

In the Plains region of Western United States and in Southern Florida, occurs the burrowing owl, a strange little round headed bird with legs longer than most owls because of its terrestrial habits. The western form lives

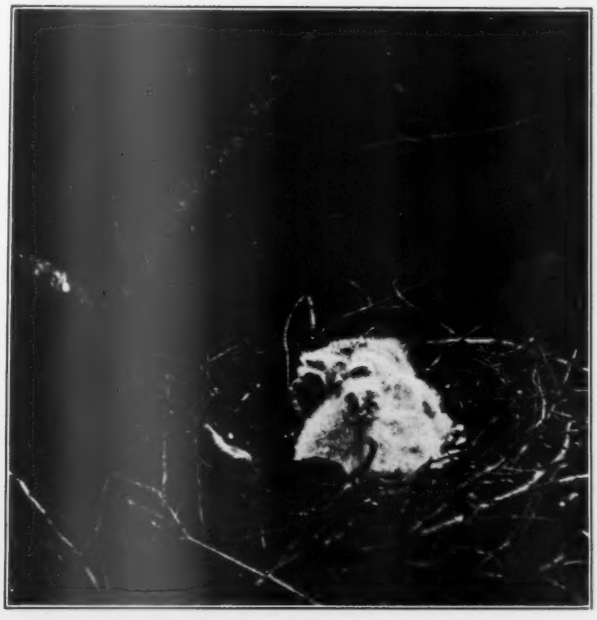
NATURE'S CAMOUFLAGE

Several species of owls have ear tufts on the head to render its contour jagged. Then when their eyes are nearly closed and the feathers drawn close, they resemble a broken piece of bark and usually escape detection. This is a little screech owl practicing his artifice upon the photographer.

in the prairie dog towns but the Florida owl digs its own burrow in the sandy soil.

The two smallest owls are the pigmy and elf owls of the Southwest. The former is a diurnal bird flying around even in the bright sun in its pursuit of insects. It measures six and a half to seven and a half inches in length and is about an inch longer than the tiny elf owl. The latter spends its days in woodpecker holes, particularly those in the giant cactus, and like other owls, comes out at night to feed.

Another diurnal owl and by far the most hawk-like of all the owls is the hawk owl. It is a gray and brown bird somewhat larger than the long-eared owl and without ear tufts. Its tail is conspicuously longer than in other owls which adds to its hawk-like appearance. It



ANOTHER CASE OF "HOARDING"

Young long-eared owls about a week old waiting for an appetite. The old birds have caught more mice than their four youngsters can eat and have left two on the pantry shelf.

inhabits northern North America and comes southward in winter rather erratically.

The second family of owls, Aluconidae, are called the barn owls. There are about 25 species and sub-species, found especially in the warmer parts of the world. All are similar in color and habits although they vary in size. They differ from the other owls in having long slender legs, and nearly white underparts speckled with

WHERE "HOARDING" IS LEGITIMATE

One of the eggs has just hatched and there is plenty of food waiting for the first child. This is the nest of a great horned owl, fifty feet from the ground in an enormous white pine. The presence of the Norway rat on the back of the nest proves that this magnificent bird is destructive, and not only to poultry

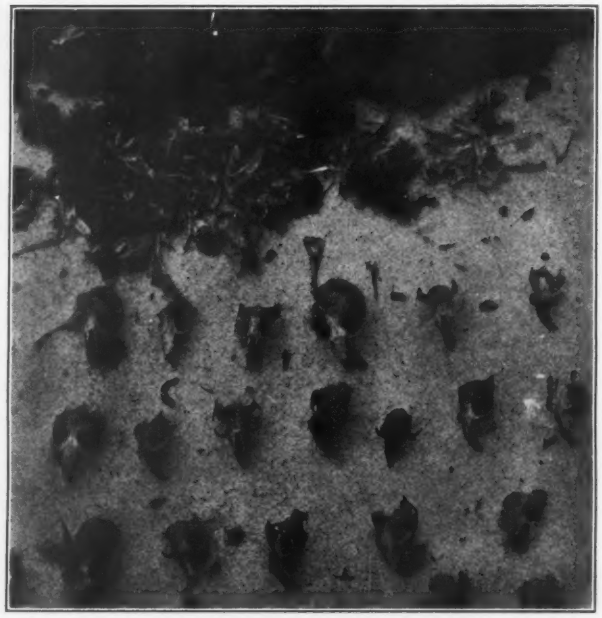
NEST OF GREAT HORNED OWL

An unusual nesting site of the great horned owl in a niche on a perpendicular cliff. The photograph was taken from the top of a tall hemlock, growing in the ravine at the top of the cliff. All owls' eggs are nearly spherical and pure white.

black. The back is a very light mixture of tan and gray. The facial disk is continuous all about the face, which, together with the black eyes, gives them a curious half human expression, so much so, in fact, that local newspapers sometimes announce the capture of a strange bird, half bird and half monkey, and one of its common names is the monkey-faced owl. There is but one species of barn owl found in North America, occurring from the Atlantic to the Pacific, occasionally as far north as New York and New England. It lives about deserted buildings, towers, and cupalos and is a most efficient mouse trap, catching from three to six or more mice every night

The majority of owls lay their eggs in cavities in trees without any pretense at a nest, but sometimes, when these are not available, they utilize old nests of crows, hawks, or even squirrels. The short-eared and snowy owls regularly lay their eggs in crude nests on the ground, and the barn owl in buildings. All lay pure white, almost spherical eggs. The young are thickly covered with down when hatched and early learn the art of self-defense by drooping their wings, shaking out their feathers, clapping their bills, or hissing.

When on the nest, the majority of owls sit very closely and if in holes may allow themselves to be captured. Some, however, like the great horned, are usually very wary and many even desert the nest if molested. Owls usually begin to incubate as soon as the first egg is laid, sometimes both birds sitting on the nest side by side. Since the eggs are not laid regularly each day as with most birds, the first eggs hatch much sooner than the last and the young birds in a nest are often of very different ages.



WHO KILLS AN OWL SAVES FIVE THOUSAND MICE

Three mice a day will scarcely satisfy a hungry owl and five years is a short life for an owl. The mice are swallowed entire and the stomach digests out the flesh, rolls up the bones and fur into neat little pellets which are ejected from the mouth. A few of these pellets have here been dissected and the skulls of the mice can be plainly seen.

If a mother owl is captured with her young and confined in a cage with them, she will frequently devour them, even though she be well fed. They are quite bold in the defense of their young, particularly after dark, when, if one venture too close, he will often be punished with eight holes in his scalp from the talons of the old bird.

Owls respond very readily to an imitation of their calls and will often come from considerable distance to investigate their supposed rivals.

AMERICAN FORESTRY is about to start a very important series of articles on the uses of wood, written by Hu Maxwell, one of the best known authorities on the subject in this country. The articles will be fully and strikingly illustrated and the value of the series from an educational standpoint cannot be overstated. The subject to be treated in the introductory article will be "Logging from Forest to Mill" and the second will cover "Sawing and Transporting Lumber." The remaining articles will consider the use of wood in the principle industries, including rough construction for buildings, wooden roofs, interior and exterior house finish, furniture, musical instruments, ships and boats, fences, boxes and crates, cooperage, horse and motor vehicles, agricultural implements, artificial limbs, woodenware and, in fact, the whole field of the utilization of wood will be thoroughly covered before the series is complete. The first article will appear in the May issue of the magazine.

THE MUCH-DESPISED SKUNK CABBAGE—EARLIEST OF SPRING FLOWERS

BY R. W. SHUFELDT, C.M.Z.S.

MAJOR, MEDICAL CORPS, U. S. A., MEMBER, L'ALLIANCE SCIENTIFIQUE UNIVERSALLE DE FRANCE

SHOULD the Middle Atlantic States have been treated to an average winter, with respect to temperature and length, the first evidence of the slackening of its grip upon nature usually begins to be observed, by those who habitually frequent the woods and marshes at all seasons of the year, somewhere along toward the latter part of February. Certain indefinable spring-like fragrances then pervade the air, and the first gratefully warm days of the approaching vernal season are welcomed by every one who loves the out-of-doors. At this time the first northward-bound phoebes have barely reached the season-tempered valleys of middle Virginia, or the vanguard of purple grackles the southern banks of the Potomac. No flowers in any way worthy of the name have yet appeared—not even in the sunniest nooks of the forest, much less in the open meadows or along the streams. A particularly venturesome hepatica may have peeped out among the dead oak and poplar leaves in some especially favored place; but this is rather to be doubted. Still less would one be likely to meet a spring beauty, although the latter is generally a wonderfully early bloomer. These and others will, nevertheless, soon be along; one can feel that their advent is close at hand. Indeed, it was only yesterday that a strider or two were seen skimming over the surface of the little brook, close to its bank, over there at the edge of the woods—just as they do all summer long every year and far into the autumn.

What a change we experience, though, as we enter that very same wood. Passing amidst the leafless oaks, chestnuts, and poplars, we find our way down the side of a gentle, tree-covered hill, to the boggy morass that lies well within this timbered area. The air is more than chilly, and it by no means carries with it the sense of approaching spring. Beneath your feet there is a heavy, overlying carpet of last year's leaves, which the snows of the winter have pretty well packed down. At the margins of the swamp, these leaves are black and soggy, and we notice that the cattle-tracks have a little water in each, frozen here and there at their margins. A couple of crows are keeping up a dismal cawing in the topmost limbs of a near-by pig-nut hickory, while some noisy jays sound an alarm in the thick and shrubby growth lower down. Overhead, the heavens are of a clear blue—cold and cloudless—a gorgeous background for the half-dozen or more turkey-buzzards that sail on motion-

SCORES OF THEM HERE, FULLY GROWN

Fig. 3—A shady Virginia swamp, late in April, at a time when the skunk cabbages have attained their full development. The Cinnamon fern, that flourishes in such places, is already far advanced, and many other plants are just appearing.

less wings in widening circles, high above this wintry landscape that stretches far, far below them.

As you stop for a moment, you wonder whether spring is really at hand—whether this is spring; or must another freeze and another snow come and be conquered

WHERE THE SKUNK CABBAGE FLOURISHES

Fig. 1—A bog in April, near the Zoological Park, Washington, D. C. The trees are still leafless, while the skunk cabbages are far advanced, as are also the mandrakes or May apples. Both have made their way up through the heavy layer of oak and poplar leaves.

by the sun's greater power, before all this is to be treated to the charms of the gentler season.

Of a sudden you detect an odor that floats up from beneath your feet. It is not necessary to describe it. It is a well-known fact that this odor is by no means unpleasant to some, while others compare it to a mixture of all the fœtid smells they can possibly conjure up in their minds. You have stumbled over and badly crushed two beautiful spathes of the famous skunk cabbage—that's all. Even Neltje Blanchan, who, as a rule, loves every odor that nature carries to her, seems to depise this one, as she asks this question: "Why is the entire plant so fœtid that one flees the neighborhood, pervaded as it is with an odor that combines a suspicion of skunk, putrid meat, and garlic?"

Richard Anthony Salisbury gave the plant its present generic name of *Symplocarus,* it being derived from two Greek words meaning *connection* and *fruit.* It is well named, for it invites attention to the fact that the ovaries coalesce or blend, to form a compound fruit. Rafinesque had it *Spathyema,* while Linnæus is responsible for its specific name of *foetidus,* the meaning of which is not far to seek in the lexicon—much less in the plant itself. As a species, it is distinctly a floral representative of the region of moist bottoms and bogs, and in such places is very abundant from Nova Scotia to North Carolina, westward to Ontario, Minnesota and Iowa.

That the skunk cabbage belongs in the Arum family (*Araceae*) almost goes without the saying, for, as Gray points out, they are "Plants with acrid or pungent juice, simple or compound often veiny leaves, and flowers crowded on a spadix, which is usually surrounded by a spathe." All this applies distinctly to the subject of this article, and equally well to its family relatives, the most conspicuous and well-known of which are the two species of Dragon Arum (*Arisaema*), the Green Dragon being one and our common Jack-in-the-pulpit the other. Then there is the familiar *Peltandra* or Arrow Arum and the Water Arum (*Calla*); finally, the Golden Club (*Orontium*) and the Sweet Flag or Calamus (*Acapus*). All of these are common aquatic plants throughout various regions and special localities of the country. It is an interesting group, and several of them are favorites with a great many people.

It is not an unusual thing to have snow on the ground when the skunk cabbages first come up in the early spring; the beautiful, sessile spathe is the part of the plant that first shows itself. This is elegantly colored, while its form is well shown in Figures 2, 4, 5 and 6 of the present article. This spathe, although it possesses

FIRST APPEARANCE OF THE LEAVES

Fig. 2—Often the fleshy spadix, over-arched by the magnificently colored spathe of the skunk cabbage, is fully developed ere the brilliant green cone, made up of closely folded leaves, unrolls and expands, to enjoy the warmth of the sun's rays, even before the winter has fairly gone by.

the same general form in plants as they run, nevertheless varies greatly in contour, size, and coloration. Some are of a purplish black both inside and out, being streaked with dark green and deep buff. Others have a ground color of rich yellowish green, with the streakings of a deep purple, interspersed with some of green. Occasion-

ally, considerable spotting is in evidence, the colors being the same as those already mentioned. As will be noted from the figures, they are ovate in form and incurved, especially when full grown.

Alice Lounsberry in her "Guide" makes a somewhat unusual statement in regard to the skunk cabbage when she says: "Children—and at an early age it may be that the nostrils are not fully developed—are particularly fond of searching for this plant and kicking it over, when its odor becomes much more intensified" (p. 44). In those parts of the country where skunk cabbages are found, there is no need of "searching" for them, as they are abundant in any boggy area of any extent; all one has to do is to walk direct to such a place.

More to the point are some of the observations of F. Schuyler Matthews on this much maligned plant. After referring to its early appearance in the spring, and its being the sole representative of its genus, he goes on to state that its leathery spathe is closely coiled, being of a purple-red color, streaked and blotched with green, all of which attracts many insects, and a host of which meet their death in the water collected in the spathe, or in the recesses of the still unopened leaves and leaf stalks. To quote him, verbatim: "The stout spadix is compactly set with perfect lavender-flesh-colored flowers, i. e., flowers with stamens and pistil. The conspicuous anthers are a greyish straw color. The fruit is the enlarged and fleshy spadix enclosing round, bullet-like seeds immediately beneath its surface which ripen in September.

"The leaves will at first be found in a compactly coiled, pointed spike, close beside the ruddy spathe. Later, when the coarse, 1—2 feet long, cabbagelike leaves are unfolded, the origin of the common name becomes evident. The odor of the flower is imitative of decaying flesh; but it is not wholly bad. It reminds one of the smell of a mustard plaster and raw onions; the cut stem decidedly suggests the latter" (p. 14).

Speaking of the fleshy spadix, which is the fruit of this plant, it may be said that it is entirely covered with the flowers when they are blooming; later, the former comes to be a dark, purplish green, supported on a lengthy stalk. As the fruit gets ripe, it shortly decays and drops off. Previous to this fate, the swollen spadix is not a very attractive looking mass, being soft and spongy, and encased in a skin-like layer, beneath which the seeds are to be found. When fully ripe, these drop to the ground and germinate, producing, in due course, the plants of the following spring.

GROWTH OF THE PLANT

Fig. 4—Here we have the opening up of the first leaf in a skunk cabbage plant. Note the beautiful venation of this elegant green leaf, so different from the conventional pattern in ordinary leaves. In the foreground there are to be seen many smaller plants of the same species; they, too, will unfold in a few days.

At a short distance, some of the larger spathes of the skunk cabbage by no means look unlike an egg-shaped lump of partially dried beef, especially in the matter of color. As its decaying meat odor comes to be perceived, this resemblance appears to be enhanced, and it requires no special stretch of imagination to fancy that it is a piece of semi-decayed meat that one sees and smells.

Little wonder, then, that many insects are attracted by these very suggestions of carrion. There are not a few species of flies that are irresistibly attracted by foulness of this character. What is still more remarkable, however, is the fact that plants like the skunk cabbage are almost entirely dependent on such insects for the distribution of their pollen, in that fertilization may follow and the species be perpetuated. Such a dependency on the one hand, and the necessity for existence upon the other, certainly offers to students of the law of organic evolution a very hard nut to crack. For a plant to evolve in such a manner as to not only look like a piece of beef carrion, but to strongly suggest the same through having an odor resembling spoiled meat—the combination making for the perpetuation of its kind—is truly a most remarkable phenomenon. The carrion flower, described in a previous issue of AMERICAN FORESTRY, is another interesting example of such reciprocity of requirements; and often, in either instance, the flies come to these plants from long distances, as has been proved by numerous observers. Another very extraordinary thing about all this is the fact that the introduced hive bees from

Figure 5

FORM OF THE SPATHE

Fig. 5—Notwithstanding its foul and foetid odor, there are not many structures to be found among our plants that are richer in color or more curious in form than the spathe of *Symplocarpus foetidus.*

INTERIOR VIEWS OF THE SPATHE

Fig. 6—In order to exhibit the form of the fruit of the skunk cabbage, one side of the spathe is cut away longitudinally, as shown in the left-hand figure.

GROWING LEAVES OF THE SKUNK CABBAGE

Fig. 7—Later in the spring a skunk cabbage plant possesses many large, heart-shaped, brilliant green leaves, all springing from a common root stock. The batrachian sitting on the leaf stem is a specimen of the Green Tree Frog (*Hyla cinerea*)—one of the most beautiful species in our country.

YOUNG LEAF OF THE SYMPLOCARPUS

Fig. 8—In outline, the leaf of the skunk cabbage is distinctly heart-shaped or cordate; the one here shown was the "wrapper" to the unfolded spike of them—also shown in the cut—the latter being made up of several leaves.

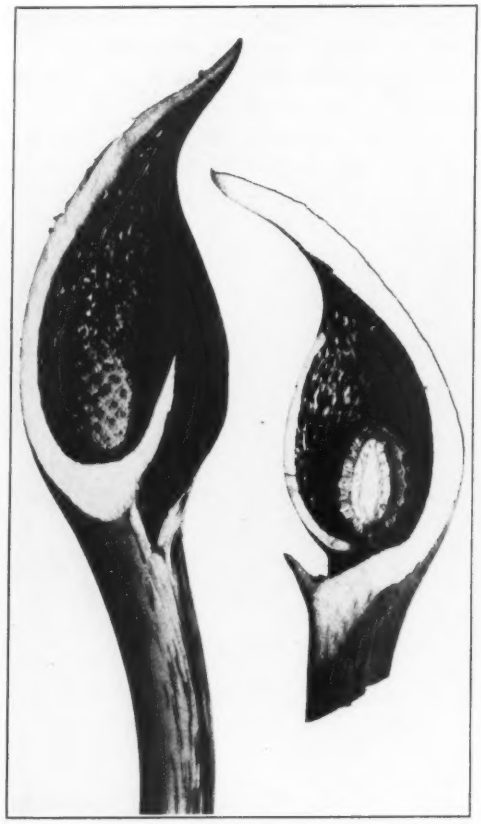
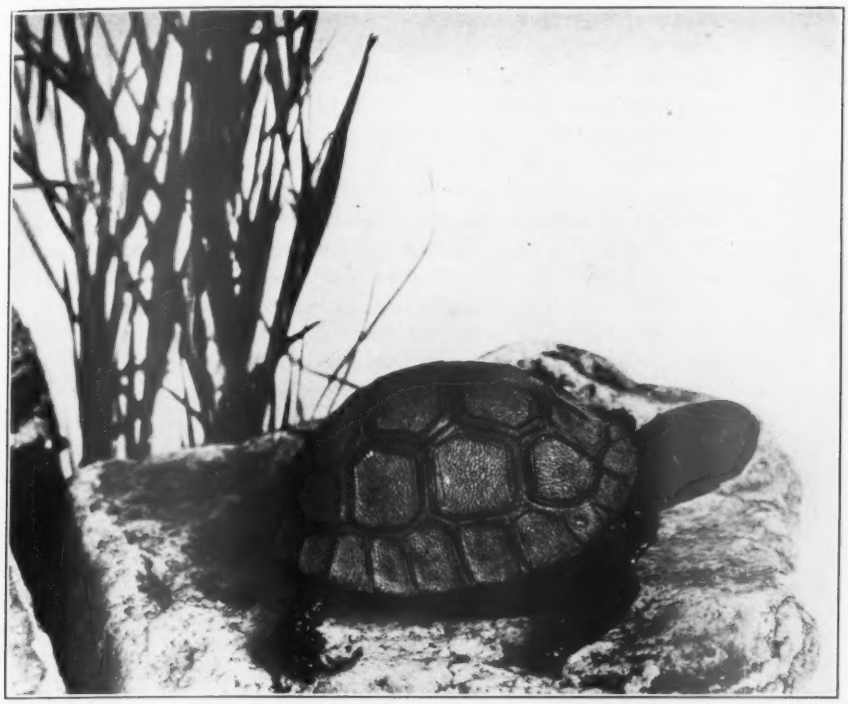


Figure 6

Figure 7

Figure 8



YOUNG OF THE GOPHER TORTOISE

Fig. 9—Of all the land animals of the peninsula of Florida, none is more widely known than the big Gopher tortoise; its history has been published in many places, while very little is known of its young. The specimen here shown was collected by one of the naturalists of the United States National Museum. The color of its shell is a buffy yellow.

Europe stand among the earliest visitors to the flowers of the skunk cabbage in the spring. These insects appear very early, and stand in need of sustenance before any other of the early flowers bloom. Now, bees are, as a rule, fastidious in their tastes; but here there is no choice; it is either the foul-smelling florets of *Symplocarpus* or nothing. Bees probably do not care to starve any more than do the rest of us.

"But the honey-bee never entered the skunk cabbage's calculations, useful as the immigrant proved to be," says Neltje Blanchan; "the horn that was manifestly designed for smaller flies often proves a fatal trap. Occasionally a bee finds the entrance she has managed to squeeze through too narrow and slippery for an exit, and she perishes miserably" and then sometimes a species of small beetle finds its way into the cavity of the spathe; but small beetles walk into all sorts of places, so the finding of such wanderers carries with it no special significance.

Another curious thing has been noticed by those who have especially studied this plant. After spring is a little further along, it will be seen that the entrances to a large number of spathes, in any particular swamp, have the delicate web of a species of spider stretched across them. It is a fat, dark-colored little spider, but it possesses a very clear idea of what it is after. It knows that, at this time of the year, many thousands of tiny, black flies swarm about the entrance to the concavity of the spathe—and thus scores of them fall a prey to these artful little arachnids. So it will be seen that in any event our skunk cabbage is very sure of being abundantly served every spring that comes round, and its seeds made absolutely certain.

When the big, green leaves of the skunk cabbage open to the sun later in the season—though still before any other spring plants are in evidence—the cattle, passing along by the bog or marsh where they grow so luxuriantly, regard them with much longing; but experience has impressed the fact upon these animals that, tempting as the leaves are to the eye, they are bitter and rank to the taste. So they are quite safe from any such danger.

Another remarkable character of the skunk cabbage plant is its root. Some have a big, central rootstock,

CRICKET FROGS (*Acris gryllus*)

Fig. 10—These are the noisy little fellows we all are so familiar with during the early days of spring; they stand among the most interesting little batrachians we have, and their remarkable habits may easily be studied in any good-sized terrarium. Most of the specimens are under an inch in length, while the majority caught are much less.

THE ENORMOUS ROOT OF THE SKUNK CABBAGE

Fig. 11—Few people have collected or even seen specimens of the root of the skunk cabbage; the reason is that they are by no means easy to collect. Their great length and very numerous parts give them a tremendous hold on the tough soil in which the plant usually grows.

closely resembling some kind of potato—even to the "eyes" (Fig. 12). It is situated close up to the stalk, while about it are arranged the great bunch of long, stout roots. These grow to be as thick as an ordinary slate pencil; they are very long, dark brown, and near their distal ends support an abundant growth of fine fibers. Little or absolutely no branching is seen on the part of any single one of these roots, the whole assemblage being arranged on ellipsoidal lines. It is an enormous root for the size of the plant; and, unless the ground happens to be very soft and soaked with plenty of water, it is impossible to pull the growth up. To be successful, either a trowel or a small spade must be used for the purpose.

As the season advances, a great many other kinds of plants come up in the bogs and meadows where the skunk cabbages grow. Several species of ferns are found among these, as well as the early grasses and sedges. Wild strawberries, too, are found where the place is a little drier, and the brambles and briars are in full leaf. Mandrakes are blooming; and in favorable localities, on rocky ledges above the water, we may possibly find a mass of giant chickweed. Scattered groups of Jacks-in-the-pulpit are also seen. All of these are so green and fresh and charming that one is very apt to overlook the skunk cabbages, or to even ignore their presence altogether. Few trees have as yet leafed out, while the elegant blossoms of the dogwood may be out in all its glory. As a matter of fact, our study of *Symplocarpus* has unwittingly carried us from the last few days of February, through blustering March, well into the lovely month of April, when not only this highly odoriferous representative of the Arum family has come to its full growth, but the flora of the season is putting in an appearance on every hand.

The vernal migration of birds is now well on—all the early migrants are here. Indeed, more than ten days ago our favorite pair of phoebes built their nest in the usual place on one of the beams under the old rustic bridge down at the creek crossing, and the pretty clutch of white eggs are already to be seen in it.

Not a few birds build their nests and rear their young right in the marsh or bog where the skunk cabbages flourish luxuriantly throughout the season. Our Maryland Yellow-throat, for instance, will some times select a place for its nest as close to a skunk cabbage plant as it possibly can, right in the midst of rank grass and bramble so frequently found in such situations. The spotted sandpiper also occasionally selects some such locality; and, as a rare event, a pair of bobwhites have been known to build in such a place.

Not only do some birds make their homes in the marshes where the skunk cabbages grow; we also find some mammals habitually doing the same, likewise various species of snakes and other reptiles, with not a few kinds of batrachians, fishes, and no end of insects and spiders, as has already been pointed out. Crayfish are also often abundant there—indeed, were we to select an average bog of some twenty acres in extent, where the skunk cabbages are growing in abundance, anywhere in the central part of its range, we could doubtless find living in such a place representatives of every animal group of the same region, all the way from the lowest invertebrate forms up to include certain mammals. Not only is this true of the warm months of spring and summer, but likewise of the bitterly cold ones of winter. During this latter period, however, the presence of any number of skunk cabbages would in

ANOTHER SPECIMEN OF THE ROOT WITH THE ROOT-STOCK DEVELOPED

Fig. 12—Here we have the root of a very old skunk cabbage; in this case the "'root-stock" mentioned by Gray, in the last edition of his work, is present. Its form is well shown, as well as the manner in which the roots come away from it, leaving scars.

no way affect either the flora or the fauna of the place; for, in the place of the high-smelling plants in question, there would be found the dead roots in the frozen ground, and the withered leaves, spathes, and the rest, above it, no part of which would in any way influence the hawks and owls, juncos and other finches, nuthatches and chickadees and other winter birds, which one usually finds in the marshes from November to March, inclusive. Much less would the dead specimens of *Symplocarpus* in any way be taken account of by the hibernating animals, such as the star-nosed and common moles, the shrews, the deer mice, muskrats, and a whole lot of other mammals which, as has been said, help make up the fauna of such places during spring and summer. All this applies, too, to such vertebrata as snakes, lizards, turtles and tortoises, and other forms. Where the skunk cabbages flourish in the extreme southern part of their range, it goes without the saying that the flora and fauna depart from the forms found in the northern regions; and while we might meet with the cricket frogs (Fig. 10) in both localities, we would find the green tree frog (Fig. 7) in the southern bogs and marshes.

THE SMYRNA FIG

BY H. E. ZIMMERMAN

THE introduction of the Smyrna fig into the United States has been attended with some interesting and yet very exasperating experiences. With all possible care in fertilization, even in a warm California climate, it was found that the figs, after reaching a certain stage in their growth, would invariably drop from the trees. Government experts were sent abroad to study the growth of the fig in its native habitat. They discovered that growing side by side with the figs of commerce there was a kindred plant known as the "Caprifig," a wild fruit of no commercial value. These men found that the Caprifig furnished the pollen for the necessary fertilization of the Smyrna fig trees, and that without this pollinization the figs dropped from the Smyrna variety just as it did in this country. These men were convinced that the Caprifig and the Smyrna fig trees must be grown side by side if results were to be attained. They accordingly brought the Caprifig to this country for this purpose, and had to wait ten years until these trees attained maturity. But imagine their amazement to find that the Smyrna trees were as unproductive as before. Artificial cross fertilization proved that the figs would remain on the tree, but how to bring this fertilization about was the question. Further investigation revealed the fact that a certain insect was necessary in order to transfer the pollen from the wild fig to the Smyrna variety. Accordingly arrangements were made to send to this country a living Capriform tree with some of these insects upon it. It arrived at just the right stage of development, and these insects immediately went forth upon their work of fertilization, thriving and starting a new race of their kind. They soon inhabited all the Caprifigs in California, and as a consequence all the Smyrnas yielded abundantly. This mysterious insect is a species of wasp about the size of a gnat, without which none of us would ever have the pleasure of eating Smyrna figs. It required twenty-five years to solve the mystery of the Smyrna fig, the raising of which has now grown into a large and profitable industry.

THE CULTIVATION OF THIS DELICIOUS FRUIT WAS MADE POSSIBLE ONLY AFTER LONG AND TEDIOUS EXPERIMENTATION.

J. H. FOSTER, State Forester of Texas, has resigned and left the state in March to take up private practice in forestry in New Hampshire. The progress of the work in Texas under his administration was most successful and the loss of his able direction will be keenly felt by his associates.

A SERIES of illustrated lectures on National Forest grazing and its relation to the war will be given on the Forests in Colorado during the next ten weeks. The District office lantern and set of slides will be routed, and from one to four lectures will be given by the Supervisors at various points on their respective Forests.

THE ROADS OF OUR LIVES

BY SMITH RILEY

UNITED STATES DISTRICT FORESTER

THERE are many different ways of courting rest when one is distraught with exhaustion or wakeful pain. I have heard of those who recite poetry, count slowly, or picture themselves ascending endless steps that are counted as they advance. There is also the sleepy road suggested by the doctor to a restless patient unable to sleep. How many of us have dream roads that loom out of the past and extend into the future, a dream indeed, yet based upon pleasurable roads we have traveled since memory has formed.

In many cases, it may be roads we have traveled daily to school, or to work, through the changing seasons. I recall one traveled often in the early years of my life,—a long stretch of straight turnpike constructed of white quartz. This road lay through a farming country and led across a series of ridges. From their crests, over spacious distances, fields, hedges, groves of broad-leaved trees and groups of farm buildings could be seen. In the early spring there was the newly ploughed ground and the smell of freshly turned earth. These actively worked fields of brown soil struck the eye in direct contrast to the bright stretches of winter wheat growing lustrous green in the first warm days of spring to be whipped later into wonderful waves of movement by the gusty winds of thunderstorms, or when, in the still hours of dusk, this grain being golden ripe for harvest, fire flies arose in countless numbers giving forth their yellow light. At one point, the way led from the broad, open highway into a side road through a stretch of oak forest where the branches of the trees formed a tunneled canopy. Here, in winter the trees giving shelter from the sweeping bitter winds, or cool shade in the summer, the call of birds and the rich woods odor filled the soul with contentment.

So our minds go back to a particular stretch of road or a series of stretches fixed in our memory to form the one dream road. The road starts in the past, but it must continue into the future to a dream land where, far from the routine of life, the calm surroundings fill our souls with rest.

Our dream road, then, is a soothing relaxation formed to give us an opportunity to regain strength and charity of soul with which to battle further. These dreams take shape in the green magic of the open, in the call of the out-of-doors, where roads lure one on to scenes of mountains, valleys and plains, lead one beside swift-leaping streams of placid lakes rippled by jumping trout or passing breezes.

STARTING OUT ON THE DREAM ROAD

The trail—our own Forest Service trail—leads first through the spruce forest, and we follow, eager to learn what it will reveal.

Dream roads are endless in the National Forests of this country. There are 155,399,809 acres of these Forests, extending through Alaska to Florida, and from the Atlantic to the Pacific, where Nature is supreme. Here children can create their dream paths, and their fathers and mothers can add to their roads a new, deep-shadowed wave, or the vista of a purple mountain height. Such roads are never completed, man can build them until the end of time.

Upon a Forest trail one awakens into consciousness at the first stirring of life before dawn, when the birds call in sleepy twitterings and animal life bestirs itself for the coming day. As the stock starts to graze, the horse bell sounds, the bull bats' swift wings give forth their how-wow whir, and a 'poorwill calls sharp and clear. And after making the fire, we wash at the tumbling stream, where delicate little flowers grow along the banks. Our attention is attracted to a small gray bird that wades jerkily from the deep water, and as it perches upon a stone, bobs an "ousel" welcome. All who love the mountains know the enchantment of locality, the pleasure of an early morning view from a stream side where bright blossoms cover the clumps of cinque foil.

"The silver-weed with yellow flowers,
Half hidden by the leaf of gray,
Blooms on the banks of that clear brook."

While far above, the rising sun tips with gold the distorted branches of old pines and spruces. Out of one of these trees sails a clark's crow—sending forth his racuous call re-echoing across the canyon. This bird launches forth as though his was an individual responsibility to make the scene more enchanting, and rightly too, for all wild life adds tenfold to the wonders of the mountains.

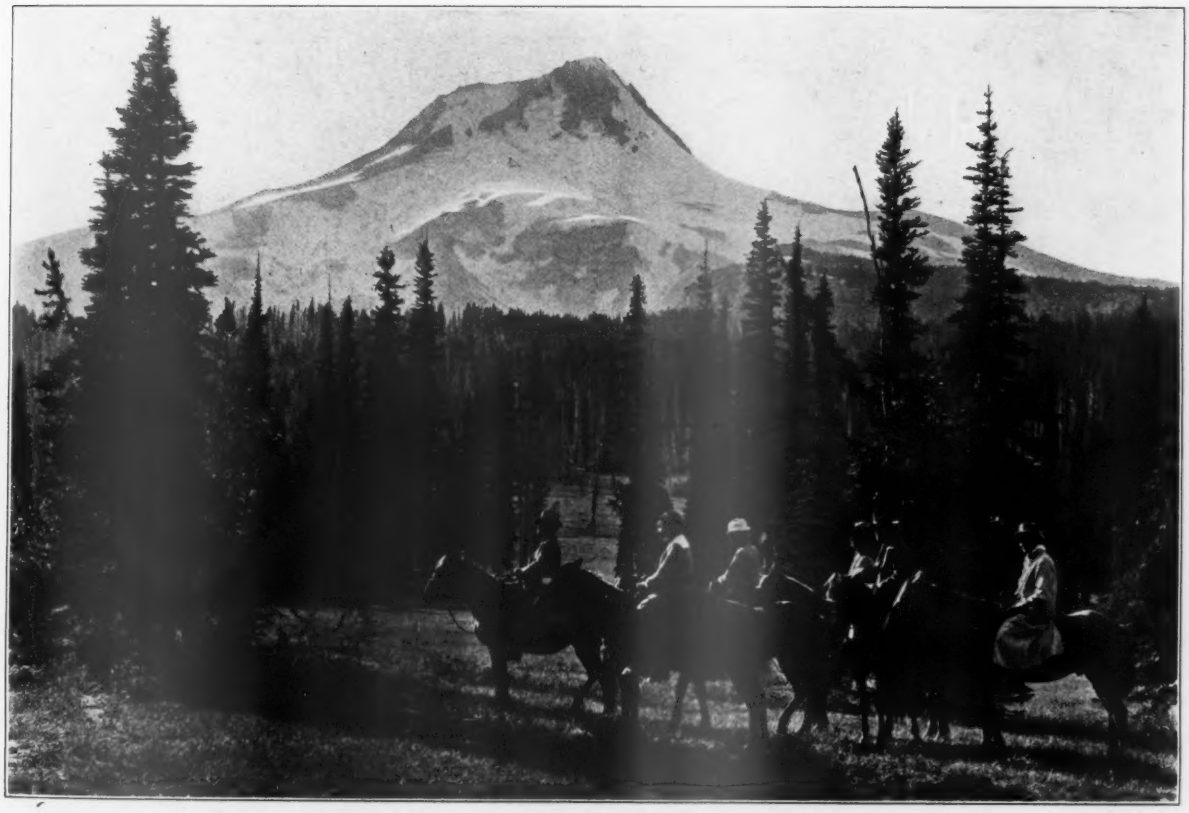
Day is coming fast; breakfast is eaten; camp is struck, and the horses packed for a start upon the dream road of the day. The way leads up the canyon along the stream into an out-door world of life. The abundant dew disappears from the tall stately mertensia; the shadows steal away as the sun rises higher. Suddenly there is a scurry of hoofs and a breaking of brush—the pack-horses start with fear as five deer leap from the willows to stand forth in defiant curiosity for one second before bounding away up the steep slope.

A STORM IN THE DISTANCE

Witnessed in safety from the far side of the lake, such storms add much to the beauty and grandeur of the mountains.

Soon the way leads out upon a ridge where spruce trees, whose crowns have been whipped into peculiar shapes by the winds, lend a distinct setting. Here there is a snow bank near whose edge small yellow lilies are blooming. Beyond the snow, two pairs of brown capped rosy finch feed. These birds winter in large flocks throughout the southwest to come for summer and nesting above timber line near perpetual snow.

Ahead is an enchanting panorama of snow peaks and canyon walls; the lower slopes are clothed with carpets



PROOF POSITIVE THAT "DREAM ROADS" ARE MOST REAL

As we follow the trail, this view of Mt. Hood, from a timbered park in the Oregon National Forest, proves beyond shadow of a doubt that dreams come true and that we may fully realize our quest for beauty by following the trails to the wonder spots in our own National Forests.

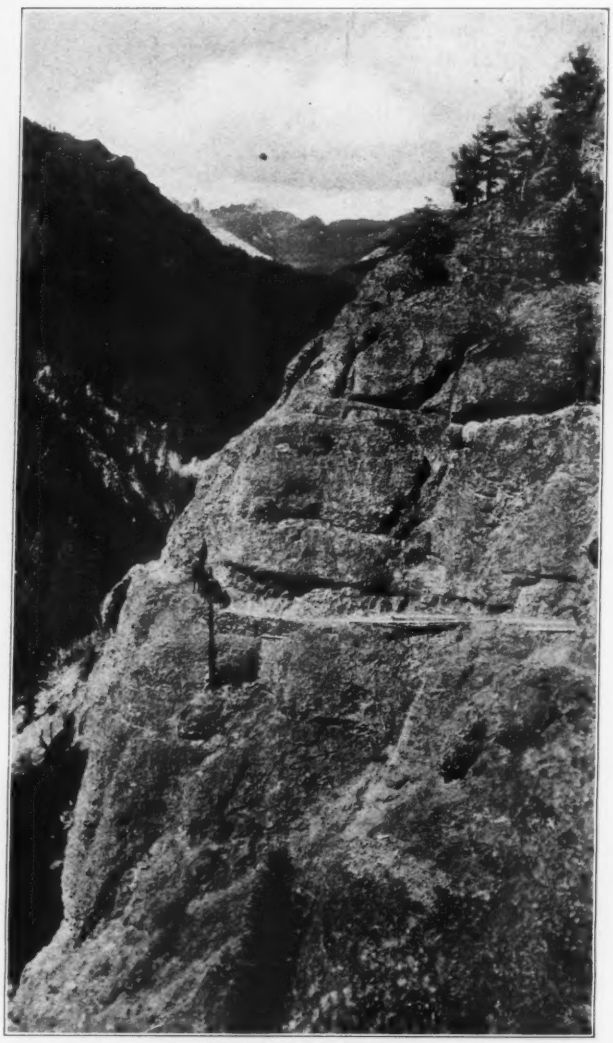
ON THE DREAM ROAD
The rising sun tips with gold the distorted branches of old pines and spruces as the world awakes.

of velvety dark green trees. Over all these are the continuously changing lights caused by the shadows from passing clouds. Here the traveler is imbued by the spell of the surroundings. The small fleecy cloud that has appeared near the summit of snow streaked peak; the shower descending far out across the sea of mountains and mesas thrill him with a sense of space and power.

The thunder rumbles far away. Suddenly this same storm that looked so small breaks with a whirlwind of fury, only to pass in a few minutes, leaving the air filled with a delightful, still freshness. Such storms viewed from the higher slopes add much to the grandeur and beauty of the mountain forests.

The trail winds down the ridge to a lake tucked away in a heavily timbered catchment basin. Near the outlet of the lake is a park or grass land bordered by a sand beach. Toward its head and in the shadow of a steep slope, lies a mass of lilies with their big flat leaves appearing dark green upon the surface of water. At this lake we stop for lunch and let our horses graze upon the dense, tender, grasses. The process of unpacking is solemnly watched by a big crane as he stands in the water near the end of a sand spit. Because of an appetite gained by an early start and a morning in the open, the lunch is delicious. After lunch, for a few rich moments we lie prone in the deep grass to watch a large hawk high in the blue as he circles in curiosity above the feeding horses.

Leaving this spot, we wander on through an afternoon resplendent with stirring views of vast areas of scenery, ever changing as the lights soften toward evening. At one point, the way leads across a plateau through spruce forests, broken by open or park areas. Here there are many groves of aspen. These trees, with their quivering leaves and graceful white trunks, are of varying sizes. Here is a group of big trees, three of their number scarred by a series of scratches upon the surface of the gray-green bark. These marks, it is plain to any observer, have been made by the claws of a bear climbing the trees. Such scratches widen and deepen as the trees grow older. There is another grove or



FURTHER ALONG THE DREAM ROAD
The way leads up the canyon—into an outdoor world of life, each turn revealing new beauty.

DREAMS THAT LEAD US ABOVE THE CLOUDS
Through vast areas of ever changing scenery we follow the trail in the Uncompahgre National Forest to a snow-covered mountain peak 13,682 feet above the sea.

group of aspens that has the appearance of a massive green loaf or half sphere. The larger trees in the center of the dome have sent out root suckers that have formed trees of varying heights to the edge of the grove. Here is another patch where the trees have started in a dense stand, and growing have extended their stately white boles upward and outward toward the edges of the grove giving the trees the effect of a cluster of bamboo.

When the shadows steal forth, we seek a camp where we can observe the closing day in all its glory. While contemplating the exact location of the camp, a shrill whistle is heard from a group of sugar loaf shaped rocks just upon the edge of the meadow bordered by still water of a large creek. By looking closely we see a large plump brown marmet seated motionless on one of the higher rocks. His black muzzle is tilted into the air as he sends forth his shrill whistle of defiance to bid these intruders leave his special preserve.

As the day life becomes quiet, the stars come out, and the mountains stand clear against the glowing sky. One who has watched intently a vast mountain region through the changing lights of fading day and growing night, can ever recall rare beauty of the scenes and is never tired of talking about them, while never is lost the desire to see them again and again.

Thus one fair dream road is ended, but with it comes a memory of strong trees and mountains and open valleys, charming in the light and shadow of that day. Out of the joys of what is past we seek to image the happiness of the future and look forward with keen expectation to the dream roads of the days that are to come,—dream roads which we may, if we so desire, shape into very real and tangible things, for our National Forests and National Parks—truly our own possessions—offer a field of exploration wide and beautiful, in which we may make our dreams come true.

AFTER THE STORM—NATURE IN HER KINDEST MOOD
It would be hard to find a spot surpassing in tranquil beauty Upper Marvine Lake on the White River National Forest, in Colorado, after a sudden thunder storm.

Forestry for Boys and Girls

by Bristow Adams

A WOOD-BEE REMEDY

THE minister started it. When the church folks got together and bought the house for him there was no coal in it. They were able to get him a little but it was soon gone; and he said he was cold. Then they could not get any more, and it was even hard to get wood.

So he called some of us together after church one Sunday and told us just what the trouble was. Someone suggested a wood-chopping bee, and one of the men said he had the wood growing in his lot, and that the church folks could have it for the cutting of it. He was an old farmer who always sat well up front because he was a bit deaf; also he always wore a fur cap, even in the summer time. He said it was the same as hair and kept the cold out in winter, and the heat out in summer.

"What little wood-cuttin' the fellers in that church kin cut," said he, "wouldn't take nothin' from my piece o' woods. Besides there's a lot of dead an' down stuff, an' a lot of crooked trees that had ought to be took out. It ain't the best ten-acre woodlot that ever laid outdoors; an' a little work put onto it won't hurt it none."

NEXT Saturday we started out to Perry's woodlot. There were eight men, and five boys and three dogs, not to say anything about axes newly sharpened, two-handed and one-handed cross-cut saws, and large lunches. It was two miles from town, but Mr. Perry sent in his bob-sleds, which were to come back again in the evening with whatever wood should have been cut. A good deal of it would be pretty well seasoned, because it had been dead some time.

Mr. Hosmer told us what to cut. Some of them growled because he picked out the crookedest and knottiest trees, so twisted and tough that they would not split. But that pleased Mr. Perry, who also asked to have all the wild cherry taken, since it furnished breeding places for the tent caterpillars that he was trying to keep out of his apple orchard.

We soon found that some of the men could really cut wood, though several said that they had not used an ax for a dozen years. Mr. Fletcher admitted that he shone best at piling, but he kept at the cutting most of the morning, until there was enough to make the piling worth while. The small boys did not amount to very much; there were too many of them, and, as someone said, "there was too much dog along." The boys studied the tracks in the snow; and if the truth must be known, the minister himself helped them at it, and knew more than all the rest. They found the trails of rabbits, a fox, deer, and red squirrels. The minister could tell from the tracks whether the animals had been in a hurry or whether they were just strolling along.

The wives and the mothers who had stayed home said that they were going to have arnica and witch-hazel and bandages all ready for those who chopped themselves instead of the wood, but there was no need of it. Mr. Ellenwood took a slice off the edge of his rubber boot, but that was the most harm that was done to anything except the lunch, which was Hooverized to the last crumb.

At the end of the day there were more than three cords of wood. Some of the piles were pretty loose,—"so's you could 'a' throwed a dog through 'em anywheres," said Mr. Perry. But there was a lot of good wood, most of which came from an old white oak log that was nearly all sound.

Next Saturday we are going to go out again, and every Saturday, unless the coal-less Mondays are kept up, and then we will get all the folks in the town that are out of work and make a regular Monday job of getting a lot of wood ready for next year's coal shortage. As Mr. Hosmer said, anything that can be done this year is only a drop; the big job is to get ready for next year when things will be a lot worse.

THERE have been meetings around here between the townspeople and the farmers. The farmers have pledged themselves to make more use of wood, and to supply it to the town if they can get the labor to cut it. And if the town people wish to come out and cut for themselves the farmers will charge only a very small price for the wood itself, and let them cut all they want, if they will take the trees that will leave the woodlots in better condition.

Since the day the minister started us off, the county fuel man has been helping. The plans we worked out have been used in a lot of other places, and the farmers around here have set the pace for the rest of the State, and even for the country.

They have put their word to paper in black and white, and it goes about like this:

During the war, no person and no business doing war work must suffer for lack of fuel.

We will do all we can to help in the use of wood for coal wherever it can be so used.

We will get out all the wood we can, and we will burn wood ourselves.

We can furnish only one-fourth of the labor needed to get out our own wood supply because so many of our sons have gone to the war, and so many of our hired men have gone to work in the cities, so it must be understood that we can not pay high prices for help and still sell wood cheaper than coal.

We will let any one cut wood from our land for from seventy-five cents to one dollar and a half for a cord, if the cutter will take the trees we pick out, and will clean up the brush afterwards, and will pay for the wood before it is taken away.

MAYBE all that is not very interesting, but it shows that even the boys can help work for the war, and that wood-bees or wood-cutting bees may be made a new form of picnic, for the cool weather on both sides of the coming summer.

THE minister said that he was sorry that he had started any wood-bee reform, because he was supposed to start only real ones. But we told him that cord-wood bees, and chopping bees, and the like were good things to start. If our countryside had more of the old "bees" that were once so well known it would be a great deal better off. There were husking bees, barn-raising bees, quilting bees, and other chances for the folks to get together. In a way, the war is helping us to find new ways to do these old things over again. The minister's study is given up one day each week to sewing for the Red Cross, and six machines are busily humming there in turning out supplies for the soldiers and hospitals. In a way we are too big to fully go back to the old ways, but the family idea is growing and we learn each day that U. S. means us.

I RECALL that Toto came in quite breathless one day and dashed down the cellar without his usual cheery greeting to his mother and the rest of the family, to emerge a moment later with the gleeful statement:

"Tagged your shovel!"

Then he explained that he had run all the way home from school so that he might put a tag on the furnace shovel "before Ev did it." The tag is to remind the old man he must be careful with the coal supply. Not that he needs a reminder! But the tag stays there even if it does catch on one's coat buttons.

When Ev got home he decided that he would have to go over to a neighbor's home with his tag, because this neighbor did not have any boy to bring him a tag from school.

We are all pretty sure that tagging the shovel of itself is not going to help much next year unless everybody adds to the coal supply by using more wood. Ministers, and farmers, and housewives, and boys, and girls—all will have to help.

THE FOREST PRODUCTS OF COSTA RICA

BY C. D. MELL

COSTA RICA has long been noted for its cedar, mahogany, cocobolo and other precious woods. This is true especially of the Pacific coast side of the Republic. The forests on the Atlantic side have supplied very little timber suitable for export, except small quantities of so-called bastard cedar and mahogany brought down the tributaries of the San Juan River. Moreover, some balsa logs (*Ochroma lagopus*) are now being exported from Pt. Limon, but no other woods of commercial value are now being exploited east of the Continental Divide. Puntarenas, the only Pacific Coast port in Costa Rica, has considerable commercial importance and is the chief timber market. It owes its origin and prosperity largely to the coffee growers in the interior and is a town of over 3,000 inhabitants.

Nearly half a century ago comfortable fortunes were made in the timber business on the West Coast. It is said that two large schooners were loaded every month in Puntarenas with cedar and mahogany logs. Practically all of these logs were cut along the small streams and rivers flowing into the Gulf of Nicoya at the mouth of which Puntarenas is located. The easily accessible trees have been cut and the available supply has now decreased to a notable extent. Although the business is still large and profitable, the operators require at present more capital than formerly to carry on the business. The expenses and difficulties in getting out the wood have greatly increased. Trees of merchantable dimensions are too far back from the banks of rivers draining into the Gulf of Nicoya to which all logs must be brought. Moreover, the streams are small and of insufficient depth to float the logs at all seasons of the year. There are still vast stretches of forests with cedar and mahogany in which foreign industry and capital might be safely and profitably invested, if there were better means of transporting the logs to port of shipment.

The operations in the forests are conducted almost entirely by men living on the concessions; having satisfied themselves as to the number of merchantable trees on the tract, they apply to the exporting houses in Puntarenas to advance them provisions and money to carry on the work under contract to deliver a specified number of logs on the river bank where they are checked and measured up. At the present time practically all exporting houses in Puntarenas have arrangements with New York dealers in these woods to make drafts on them for the amounts advanced to contractors. Such contracts are usually made in September and October and as soon as the rainy season is over, which is about the first of December, the contractors hire gangs of men for the season. The men are hired either by the day or by the task. The wages paid range from one to

COSTA RICAN FOREST TYPES

The cocobolo of the West Coast, a rosewood and closely related to the true rosewood.

A clump of native cedar. The quality and beauty of this wood is widely known.

The Costa Rican fustic, with high commercial value and now well known in American markets.

LUMBERING IN COSTA RICA

In a country famed for its precious woods, it is interesting to note some of the methods employed in lumbering and marketing this resource. The first picture shows the native cocobolo logs peeled, and the second fustic logs, piled on the river bank for checking and measuring up, while the third and fourth show native timbers in process of shipment from Puntarenas, the only Pacific Coast port in Costa Rica, and a raft alongside the steamer. After felling and squaring, loading is done by hand and hauling, which is most difficult owing to the rough and hilly country, is accomplished by the employment of oxen. In the last picture is seen a raft of logs, landed at Puntarenas.

ALONGSIDE THE STEAMER AT PUNTARENAS

A raft at the port to which come most of the logs cut along the small streams and rivers flowing into the Gulf of Nicoya.

two colones (35 to 70 cents) per day. Early in December the work starts and camps are organized at convenient points near the streams in the tract to be worked. Temporary huts thatched with palm leaves are erected for the laborers. The workmen are divided into gangs and captains appointed for each gang, whose duties are to assign the men their daily tasks and see to it that they are properly done.

The men who fell and square the logs are experienced and do task work, which means that they get a specified amount for every cubic yard of cedar and mahogany they prepare for hauling. In case of cocobolo and fustic they are paid on the ton basis. The best laborers are out and at work at day break and generally finish their task by noon when the sun becomes oppressively hot. The rest of the day they spend at camp. Those engaged in hauling timber from the stump to the river bank by means of ox carts are hired by the day. They work from 2 A. M. to about 11 A. M. The oxen cannot stand the hot afternoon sun on these rough roads. All the timber-producing regions in Costa Rica are without roads and the first work to be done on a concession is to cut a cart road or path through the center. From the main road branch roads are opened to every tree on the tract. The carts employed are very clumsy and antiquated contrivances. The wheels are made generally of solid wood, either cedar or guanacaste. The oxen are fed on sugar cane and on what they can find in pastures provided for them.

Hauling logs is a very difficult undertaking in this rough and hilly country without roads. The bulk of the logs have to be transported on carts drawn by oxen for distances varying from five to 15 miles requiring from one to three days to haul a log from the stump to the river bank. After a number of logs have been collected at one spot on the river or streams and are measured and checked they are turned adrift loose and caught in a boom at the mouth of the river. Several men are hired to follow the logs down stream for the purpose of releasing those which are caught by fallen trees or other obstacles in the river. At the mouth of the river the logs are made into a raft to be floated down the Gulf to Puntarenas for loading on steamers. There are about ten cedar trees to one mahogany on the west coast and as one goes back into the hills mahogany disappears entirely. The mahogany of this region is only slightly heavier than cedar and often floats even in the unseasoned condition. Logs of other species except some pochote sink in water, and for this reason raft-logs of defective cedar are used to buoy them up in transit. Genizero, pochote, quechimbo, guanacaste, and palo maria are the principal timber-producing species that are now being

AN UPHILL DRAG

Sometimes these heavy logs must be drawn by the oxen for a distance of ten or fifteen miles to the river bank, and on heavy grades every one does his bit to lighten their task.

exploited besides cedar and mahogany and these are chiefly for local consumption.

Cocobolo, fustic and Brazilette are three well-known varieties of wood of Costa Rican origin coming into the American markets. They are West Coast species, where they attain best development. Cocobolo is a rosewood and is botanically closely related to the true rosewood (*Dalbergia nigra*). It is cut here in large quantities and, like dye woods, has a white useless sap wood which is removed in the bush. The pieces are very irregular ranging from five inches up to two feet or more in diameter after the sap wood is cut away. The fustic and Brazilette are treated in the same manner. These woods are heavier than water and cannot be floated; for this reason they must be hauled to some convenient point on the Gulf of Nicoya where they are loaded on special punts or boats having a capacity of about 50 or 60 tons for transportation to Puntarenas. The building of these punts is an important industry in Puntarenas. The frames are made of genizero and the planking is generally out of cedar or palo maria, which are woods well known for their durability and comparative inmmunity to the ravages of sea worms. Cedar, mahogany, cocobola, fustic and Brazilette are the only kinds now being exported and the total value at port of shipment does not exceed $200,000 annually.

PROHIBITION OF IMPORTATION OF NURSERY STOCK

A BILL to prohibit the importation of nursery stock into the United States has been introduced in the Senate by Senator Weeks and now awaits action by the Committee on Agriculture and Forestry to which it has been referred.

A committe recently conferred with Secretary of Agriculture Houston in reference to this bill and presented to him arguments in favor of it.

Following this AMERICAN FORESTRY received from C. L. Marlatt, chairman of the Federal Horticultural Board, a memorandum which indicates the Department of Agriculture's point of view relative to further restrictions on the importation of nursery stock. This memorandum is as follows:

"Numerous inquiries have been received by the Department regarding the prohibition, in order to prevent the introduction of insect pests and plant diseases, of the importation of nursery stock into the United States, except for experimental or scientific purposes by the United States Department of Agriculture, effective July 1, 1918.

"The experts of the Department have given careful consideration to this matter and also to the proposal regarding the immediate exclusion of certain classes of nursery stock and the exclusion of other classes after the expiration of a reasonable period to permit adjustment of the interests affected.

"As to the need of additional Federal plant quarantine powers, it may be pointed out that the Federal Plant Quarantine Act of 1912, as amended, gives authority to enforce any prohibitions or other restrictions on the importation of nursery stock or other plants and plant products necessary to prevent the introduction of insect pests and plant diseases. Under this Act there are now in force 11 foreign quarantines prohibiting, and 8 orders regulating, the entry of plants and plant products. This Act includes not only the plants actually described as "nursery stock," but also any other class of plants or plant products the entry of which it may be desirable to restrict or prohibit. Furthermore, wherever the necessity therefore arises, in order to prevent the introduction of dangerous diseases or insects, the importation of whole classes of plants, or those coming from specified world regions can be prohibited or regulated.

"As a result of the consideration which the experts of the Department have given the matter, it appears very doubtful whether the horticultural development of this country has reached the point where the complete exclusion of foreign nursery stock in order to prevent the introduction of diseases and insects could have other than harmful effect. Precipitate action at this time would give no opportunity for readjustment to those phases of the industry which would be most seriously affected and would greatly handicap plant propagators of the United States and work financial injury to many branches of horticulture. At the present time there is no available supply of stock in this country for the production of many kinds of fruits and ornamentals, nor is it possible now to obtain from domestic sources seeds from which several of these stocks can be grown.

"The situation, therefore, calls for constructive action. Before any general program of exclusion, if such should be necessary to protect this country against insects and plant diseases, could be intelligently considered, more information is needed concerning the importation now being made, the necessity therefor, as well as the existence and geographical distribution of foreign plant parasites likely to be introduced with such importations. This information is now being accumulated by the branches of the Department dealing with such matters. The Bureau of Plant Industry is extending its studies of nursery problems to secure definite information regarding the kinds and quantities of plant material grown abroad and introduced as seeds and stocks or materials

THE Board of Directors of the American Forestry Association at their annual meeting on January 11, 1918, passed the following resolution:

"That the American Forestry Association declares itself heartily in favor of adequate legislation providing for prohibiting the importation of nursery stock into the United States in order to prevent the introduction of insect pests and plant diseases."

for forcing; the practicability of growing these seeds and stocks and other plant materials in this country; encouragement of local activities for the production of plant materials we now import, including seeds for such stocks as pear, peach, cherry, apple, and other fruits; and the determination of localities in the United States where stocks and similar plant materials may be successfully grown. Several field stations, well located, equipped, and organized, are already available for this work, and valuable records, the accumulation of nearly 20 years' world-wide explorations, also are at hand for immediate use.

"Much of this work will be carried out through the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry. This Office is charged with all matters relating to the introduction for this Department of foreign seeds, plants, bulbs, etc., for scientific and experimental purposes and co-operates with the Federal Horticultural Board in maintaining facilities for inspection and quarantine. This Office has already been the means of introducing, testing, propagating and distributing many new plants, including among these a number of promising disease-resistant pears, peaches, cherries, roses, and other plants which are now being propagated and tested preparatory to their more widespread use.

"The experts of this Department feel that every reasonable effort should be made to stimulate the propagation in the United States of necessary plant stocks in order to eliminate the danger of bringing in dangerous plant diseases and insect pests. In any event, if, in order to protect this country against such plant diseases and insects, it should become necessary to consider the complete exclusion of nursery stock, the matter should develop gradually, affording opportunity for adjustment, rather than result from immediate and drastic action. In the meantime, under the existing Plant Quarantine Act, quarantine action in addition to that now in force can be promptly taken as to any plant or class of plants or plant productions whenever it is evident that the danger outweighs the sacrifices involved."

FORESTRY NOTES AND COMMENTS

THE Senate has passed a number of land bills affecting National Forest administration. One of these authorizes the Secretary of the Interior to exchange any lands in Government ownership, including National Forest lands, coal lands, and oil lands for private lands of approximately the same character and value within Government reservations. Another bill authorizes the inclusion within the Oregon National Forest of all lands on the Bull Run watershed that were recovered by the United States as a result of the Oregon and California Railway suit. Two other bills provide for exchanges in the Sevier National Forest.

THE Aviation Section of the Signal Corps, United States Army, has been enlisting woodsmen to get out airplane spruce. The work will be done in Oregon and Washington and the men will be organized into aviation squadrons on military lines. Some will be sent to the new cut-up mill built by the Government, but the majority will go to the various lumber camps, where they will receive from the lumber companies, in addition to their Government pay, enough money to make their wages equal those paid civilian lumbermen in the region. They will work, however, under their own officers.

TO tell the Russian people what the National Forests mean to the people of the United States, United States Forester Graves has undertaken an article which will be translated into Russian and distributed in the new democracy. The article is being prepared at the request of the Committee on Public Information, which is striving to acquaint the people of Russia with American ideals and methods of government.

AROUSED to the acute need for prevention of fires in forest, range, and grain fields as a war measure, State and Federal officials and representatives of the lumber industry have organized a joint committee to find solutions, if possible, of fire prevention problems in California. This committee, known as the Forest Industries Committee, is composed of State Forester G. M. Homans, Chairman; Acting District Forester Roy Headley; Professor Woodbridge Metcalf, of the College of Forestry, University of California; C. Stowell Smith, Secretary of the California White & Sugar Pine Manufacturers' Association; and R. E. Danaher, President of the R. E. Danaher Lumber Company. At a meeting of the committee, in San Francisco, plans were discussed for an intensive state-wide publicity and educational campaign to awaken the public to the immense amount of food and war materials destroyed on the Pacific Coast last summer by fire, to the large amount of money spent in fire control, and the great amount of labor drawn from farms and factories to fight fires.

MORE sugar cane and beets will have to be raised, more maple sugar produced, and additional enthusiasm instilled into the bees if we are to have sweetening in our coffee next year. As a means of forestalling sweetless days, the Forest Service and the Bureaus of Animal Industry and Entomology, in co-operation, have prepared a special publication telling how the production of natural sugar may be increased. This will be distributed by the States Relation Service through the county agents. It should be of special interest to sugar cane and beet growers and to owners of sugar maple orchards and apiaries.

AMERICAN FORESTERS IN MILITARY SERVICE

This list is compiled from various sources. Every effort has been made to make it complete and accurate, but in the nature of things there are necessarily omissions and errors. The list will be reprinted and increased from month to month. All foresters and others who can supply additional names or note corrections are urged to communicate with American Forestry as promptly as possible, to the end that the list may have full value as a record of the men who have gone to war.

AGEE, Fred B., 1st Lt., Engr. Corps (For.); U. S. R., A. E. F., P. O. 702, via N. Y., deputy forest supervisor, U. S. F. S.
Adams, George (Ohio State Univ.), 10th Eng. (For.).
Albano, Jack, forest ranger, U. S. F. S.
Alden, E. E. (Mich. Ag. Col., '15).
Aldous, Tura M., grazing, U. S. F. S.
Aldsworth, Donald (Univ. of Minn., '14), Off. Tr. Camp, Presidio, Cal., San Diego, Cal.
Alexander, Ben. (Bilt. For. School), 2nd R. O. T. C.
Alexander, J. B., 1st Lt. Aviation Corps (Univ. of Wash., '17).
Allen, Raymond, New Jersey.
Ames, F. E. (Yale For. School, '06), Capt., Co. B, 7th Bn., 20th Eng. (For.).
Anderson, A. C., 2nd Lt. U. S. A., Ft. Leavenworth, Kan. (Univ. of Wash., '17).
Anderson, Albert T. (Ore. Ag. Sch. For.), 2nd Lt., National Army.
Anderson, Emil A., deputy forest supervisor, U. S. F. S.
Anderson, Parker O. (Univ. of Minnesota, '16), 10th U. S. Eng., France, U. S. F. S.
Andrews, A. K. (Ore. Ag. Sch. For.), Sgt., 116th Eng.
Archer, Frank L., Engr. Headquarters, France, forest clerk, U. S. F. S.
Archibald, H. (Ore. Ag. Sch. For.), Sgt., 116th Eng.
Armstrong, Carroll W. (Bilt. For. School), Quartermaster's Dept., Fort Dodge.
Armstrong, Ralph H. (Bilt. For. School), 104th Inf., Expeditionary Forces, France.
Atkinson, E. S. (Yale For. School '16, and Biltmore), 2d Lt., Ft. Grant, Canal Zone.
Atwood, C. R. (Univ. of Maine, '15), manager, Unit 1, New England Sawmill Units.
Aylward, F. N. (Univ. of Calif.), Amb. Corps.

BACKUS, Romayne L. (Univ. of Minn., '18), 20th U. S. Eng., U. S. F. S.
Badertscher, Ed., temp. clerk, U. S. F. S.
Baker, Hugh P. (Yale For. School, '04), Capt. 46th U. S. Inf., Camp Taylor, Louisville, Ky., Dean N. Y. State Col. of Forestry.
Baldenburg, Max B., clerk, U. S. F. S.
Balderee, E. W. (Ore. Ag. Sch. For.), Corp., 116th Eng., A. E. F.
Baldwin, H. C. (Penn. State, '14).
Ballew, William Murray (Yale, '15), 5th Bn., 20th Eng. (For.), A. E. F.
Balmer, Joseph D. (Uni. of Wash., '18), Sgt. Bat. D, 346th Fld. Art., American Lake Encampment.
Ballard, Dean (Uni. of Wash., '12), American Lake Encampment.
Ballou, F. C. (Penn. State, '16), 20th Eng. (For.), 3rd Bn., Co. C.
Barbur, Hal (Ore. Ag. Sch. For.), 1st Lt.
Barker, S. Omar, Co. D., 502nd Service Bn., Camp Merritt, N. J., U. S. F. S.
Barlow, Harold (Yale For. School, '14), 1st Lt., Ordnance, Coe Brass Bldg., Ansonia, Conn.
Barnett, William L. E. (Yale, '15), Section Sanitaire, U 70, Convois Automobiles, par B. C. M., Paris, France.
Barr, John B., forest ranger, U. S. F. S.
Barton, Robert M., 20th Eng. (Forest), Amer. Univ., Wash., D. C.; forest ranger, U. S. F. S.
Bastian, Clyde E., Corp. 20th Eng. (For.), Univ. of Mich., '16).
Batten, R. W. (Yale For. School, '16), 10th Eng. (For.), A. E. F.
Bay, Helmuth (Mont. For. School), 20th Engineers.
Beal, Cecil R. (Univ. of Wash., '17), 2nd Lt. 20th Eng. (For.), American Univ., Washington, D. C.
Beals, James B., 20th Eng. (For.), forest ranger, U. S. F. S.
Beam, Donald (Iowa State Col. ex, '20), C. A. C., 1st Co., Ft. De Bussey, Honolulu, Hawaii.
Beaman, Clarence W., messenger, U. S. F. S.
Beaman, La Vaughn, Co. A, 5th Bn., 20th Eng. (For.), U. S. F. S.
Beattie, Homer Milo (Mich. Univ., '04), Sgt. 10th Eng. (For.).
Bedwell, Jesse L., forest ranger, U. S. F. S.
Beebe, P. (Mont. For. School), 20th Engineers.
Behre, C. Edward (Yale, '17), Co. F, 4th Bn., 20th Eng. (For.), A. E. F., U. S. F. S.
Bell, Ernest (Univ. of Minn., '16), Lt. Rainbow Div., Camp Mills, N. Y.
Bell, George R. (Yale For. School, '18), 2nd Lt., 12th Fld. Art., A. E. F.
Bellue, A. (Student Univ. of Cal.), 10th Eng. (For.).
Beltz, H. C., 1st Lt. (Mich. Ag. Col., '18).
Benedict, M. S., 1st Lt. 10th Eng. (For.); forest supervisor, U. S. F. S.
Benedict, Raymond E., Major 10th Eng. (For.), For. Br. B. C.
Bennett, Edwin L., Co. H 157th Inf., Camp Kearney, Cal., forest ranger, U. S. F. S.
Bennett, Harry C., forest ranger, U. S. F. S.

THE ROLL OF HONOR

IN THIS ROLL OF HONOR WE WILL PUBLISH EACH MONTH AS THEY ARE RECEIVED OR REPORTED TO US, THE NAMES OF FORESTERS WHO MEET DEATH IN SERVICE.

AUGSPURGER, STANLEY R., Dayton, Ohio. Field assistant, U. S. F. S., District 6. Lost on the *"Tuscania."*

MUNCASTER, ROY (Univ. of Wash., '17), Ranger, U. S. F. S., Olympic National Forest. Lost on the *"Tuscania."*

REES, H. S. (Univ. of Wash., '14), Canadian Contingent, killed in battle in France.

REES, L. A. (Univ. of Wash., '14), Canadian Contingent, killed in battle in France.

SHARP, MILTON K. (Univ. of Ohio, '16), Bat. A, 134th Field Art., killed December 5, 1917, Montgomery, Ala.

SIMPSON, C. E. (Penn. State Col., '16), 10th Eng. (For.), died in Scotland October 3, 1917.

SMITH, A. OAKLEY (Yale For. School, '14), killed while training for aviation, drowning in Delaware River by fall July 21, 1917.

YOUNG, DOUGLAS E., private English Army, killed in France April 10, 1917, was State Forest Warden, Maryland.

Bennett, William W. (Univ. of Nebr., '12), Co. E, 314th Ammunition Train, Camp Funston; Fort Riley, Kansas, dep. for. sup., U. S. F. S.
Benson, A. O., 3rd R. O. T. C., forest examiner, U. S. F. S.
Bentley, George A., Capt. Quartermaster's Dept., purchasing agent U. S. F. S.
Bernhardt, Carl L. (Univ. of Wash., '18).
Berry, John K., scaler, U. S. F. S.
Berry, Swift, forester, U. S. F. S.
Betts, E. G. (Iowa State Col. ex, '15), 1st Lt., 20th Eng. (For.), Camp American Univ., Wash., D. C.
Betts, Fred H., forest ranger, U. S. F. S.
Bevan, Arthur (Univ. of Wash., '17); Canadian Eng., France.
Bevan, Jesse T., Co. E, 10th Eng. (For.), A. E. F., France, U. S. F. S.
Beyers, Walter F. (Univ. of Minn., '12), Capt., Camp Dodge, Iowa.
Billin, R. T. (Penn. State, '20), 10th Eng. (For.).
Billings, R. W. (Mich. Ag. Col., '17), 10th Eng. (Forest).
Billingslea, James H., Jr. (Univ. of Wash., '11), Top Sgt., 10th Eng. (For.), forest ranger, U. S. F. S.
Bird, R. G., Corp. 20th Eng. (For.); (Cornell, '16).
Bird, Vern A. (Univs. of Minn. and Utah), 20th Eng. (For.), forest ranger, U. S. F. S.
Blair, Albert W., 20th Eng. (For.), forest ranger, U. S. F. S.
Blair, Earl M. (student Univ. of Cal.), 20th Eng. (For.).
Blake, Philip (Univ. of Minn., '16), Marine Barracks, Quantico, Va.
Black, John J., Naval Res., draftsman, U. S. F. S.
Bliss, James (Ohio State Univ., '14), Capt., Chillicothe, Ohio.
Bloom, Adolph, Ensign U. S. N. Train. Sta. (Univ. of Wash., '16).
Blouse, Joseph R. (Mt. Alto, '16), Pa. Dept. For.
Bodine, R. C. (Ore. Ag. Sch. For.), Co. B, 20th Eng. (For.).
Boisen, Rev. Anton T. (Yale, '05), Secretary, Y. M. C. A., 31 Ave., Montaigne, Paris, France.
Bonner, James H., Capt., 1st Co., E. O. T. C., Camp Lee, Petersburg, Va., acting dean Mont. For. School.
Bonney, Parker S., sub. lt., Br. Navy (Univ. of Wash., '13).
Booy, Henri (Minn. For. Sch.), 10th Eng. (For.), A. E. F.
Bosworth, James H. (Univ. of Mont.), 20th Eng. (For.), Amer. Univ., Wash., D. C., U. S. F. S.
Bothfeld, Harry Julius (Yale, '12), Corp., 302nd Inf., Co. H, Camp Devens, Mass.
Bowen, James H., 20th Eng. (For.), forest ranger, U. S. F. S.
Bowen, John S., 20th Engineers (Forest), Amer. Univ., Wash., D. C., U. S. F. S.
Bowen, Jos. B. (Yale For. School, '17), Royal Flying Corps, Camp Everman, Field 2, Fort Worth, Texas.
Boyce, W. H. (Penn. State, '17).
Bradley, Tom O. (Student Mt. Alto), 3rd Bn., 20th Eng. (For.), A. E. F., Pa. Dept. For.
Brady, Charles C. (Univ. of Wash., '18); Battery A., Wash. Signal Corps.
Brady, Seth C., messenger, U. S. F. S.
Brayton, Shirley (Univ. of Minn., '18), 20th U. S. Eng., A. E. F.
Breneman, Howard E. (Mt. Alto, '17), Co. C, 1st Bn., 10th Eng. (For.), A. E. F., Pa. Dept. For.
Brett, S. E. (Ore. Ag. Sch. For.), Capt., 20th Inf., A. E. F.
Brewster, Donald R., forest examiner, U. S. F. S.
Brinckerhoff, H. E., 1st Lt. Inf.
Brindley, Ralph, 2d Lt., Bat. C, 346th F. Art., R. O. T. C. (Univ. of Wash., '17), American Lake Encampment.
Brockway, M. (Univ. of Me., '15), checker, Ten Saw Mill Units.
Broderick, Martin J. (Univ. of Minn., '16), 1st Sgt. U. S. Engr., Co. C, 501 Bn., Engr., 20th Eng., A. E. F.
Brooks, James F. (Montana For. School, '17), 10th Eng. (For.), forest ranger, U. S. F. S.
Brown, Bascom H., forest ranger, U. S. F. S.
Brown, Harold B., 20th Eng. (For.), forest ranger, U. S. F. S.
Brown, R. A., Co. D, 23rd Eng. (Highway), Camp Meade, Md., U. S. F. S.
Brown, Thomas (Univ. of Minn.), Marines, A. E. F., France.
Brown, Robert C., asst. forest ranger, U. S. F. S.
Brown, V. S. (Univ. of Cal., '14), 10th Eng. (For.).
Brown, Vance, scaler (Univ. of Wash., '17), Bat. A, Wash. Sig. Corps, U. S. F. S.
Browning, Harold A., asst. for. ranger, U. S. F. S.
Broxon, Donald (Univ. of Wash., '14).
Bruce, Donald (Yale For. School, '10), Capt., 10th Eng (For.), assigned in charge of timber, reconnoissance in France. (Prof. of For. Univ. of Cal.).
Bruce, James, U. S. F. S.
Brundage, Marsden R. (Mich. Ag. Col., '17), 20th Eng. (Forest).
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Campbell, Tom (Ore. Ag. Sch. For.), U. S. S. Northern Pacific.
Cappel, Frederick, for. clk., U. S. F. S.
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Clark, Donald H. (Univ. of Wash., '17), 1st Lt., Bat. F, 348th Field Art., American Lake Encampment.
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Haworth, Robert (Univ. of Minn., '13).
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Hayslip, E. E. (Ore. Ag. Sch. For.), 20th Eng. (For.), Co. B.
Hazeltine, Caryl R. (Ore. Ag. Sch. For.), 346th Light Fld. Art.
Heath, Frank (Biltmore), Capt. 361st Inf., Camp Lewis, Wash.
Hendrickson, Guy C., forest clerk, U. S. F. S.
Hendrix, Albert W., forest ranger, U. S. F. S.
Henry, A. S. (Iowa State Col., '17), Aviation.
Henry, D. D., 2nd Lt. (Mich. Ag. Col., '15).
Henwood, C. H. (Penn. State, '14), National Army.
Hesner, Harold (Iowa State Col. ex, '19), Kelley Field No. 2, 3rd Bn., Line 59, So. San Antonio, Texas.
Hetrick, R. E. (Mich. Ag. Col.), Forestry Dept., U. S. F. S.
Hicock, Henry W. (Yale For. School, '15), 504th Eng. Battery Service.
Hicks, L. E., forest ranger, U. S. F. S.
Hicks, A. L., Camp Lewis, American Lake, Washington, patrolman, U. S. F. S.
Hill, F. C., forest ranger, U. S. F. S.
Hill, Horace C., Sgt., Signal Corps, Kelly Field, So. San Antonio, Tex., forest guard, U. S. F. S.
Hill, Rollin C., 10th Engineers (Forest), Am. Exped. Forces, France, U. S. F. S.
Hilliard, L. E., woodsman, Ten Saw Mill Units, England; Mass. For. Dept.
Hinde, Urbin J., Co. E, 4th Bn. 20th Eng. (For.), American University, Washington, D. C.
Hirst, E. C. (Yale For. School, '09); Gen. Mgr., New England Sawmill Units, Ardgey, Rosshire, Scotland; State for. New Hampshire.
Hoag, Egbert (Minn. For. Sch.), 20th Eng. (For.), A. E. F.
Hodgman, Arthur (Univ. of Minn., '12), 10th Eng. (For.), A. E. F., U. S. F. S.
Hogentoler, Joseph R. (Mt. Alto, '12), Bat. F, 108th Fld. Art., Camp Hancock, Augusta, Ga., Pa. Dept. For.
Holdsworth, R. P., Capt. (Mich. Ag. Col., '11).
Holman, Thomas (Ohio State Univ., '17), Co. E, 2nd Bn., A. E. F., 20th Eng. (For.).
Holt, Felix R. (Yale For. School, '02), Paymaster, U. S. N., Navy Yard, Norfolk, Va.
Honeycutt, E. E., 20th Engineers (Forest).
Hope, L. S. (Yale For. School, '16), 2nd Canadian Pioneer Bn., B. C. F., France. Address care of Arm Postoffice, London, England.
Holtze, E. B. (Univ. of Mo.); 10th Eng. (For.).
Benj. Harrison.
Horn, Eugene F. (Yale, '13), recommended for 1st Lt. in one of the Forest Regiments.
Horning, W. Harold (Mt. Alto, '14), Co. D, 10th Bn., 20th Eng. (For.), Amer. Univ. Camp, Washington, D. C., Pa. Dept. For.
Hough, R. J., (Ohio State Univ., '15), Inf., Ft. Howe, George (Ore. Ag. Sch. For.), 116th Eng.
Hoyer, Vernon B. (Iowa State Col., '18), Co. F, 6th Bn., 20th Eng. (For.), A. E. F.
Hudman, H .H., Co. B, 10th Eng. (For.), A. E. F., France.
Huff, Rolland (Univ. of Nebr., '16), 20th Engr. (For).
Hufton, George W. (Wyman Sch. Woods, '16), Field Artillery.
Hughes, Robert W. (Univ. of Wash., '20), Av. Training Camp, San Diego, Cal.
Houpt, William E. (Mt. Alto, '09); Co. F., 2nd Bn., 20th Eng. (For.), formerly Pa. Dept. For.
Houtz, Jesse (Mt. Alto, '133), 2nd Lt., 310th Fld. Art., Camp Meade, Md., Pa. Dept. For.
Hugo, P. (Penn. State, '19), National Army.
Hull, J. H. (Yale For. School, '11).
Humphrey, H. J. C. (Yale For. School, '09), Lt. Reg. Army, 5th Inf., Empire, Canal Zone.
Hutchings, James O., 10th Eng. (For.), A. E. F., France, U. S. F. S.
Hussey, Ralph W., forest ranger, U. S. F. S
Hutton, George W. (Yale, 14), 1st Bat., Officers' Training Camp, Camp Lewis, Wash.
Hutton, James F., Signal Corps (spruce regiment), forest ranger, U. S. F. S.
Hyatt, Wallace (Ore. Ag. Sch. For.), 20th Eng. (For.).

INGALLS, E. E. (Yale For. School, '17), Co. B, 10th Eng. (For.), A. E. F.
Inskeep, Raymond P., Machine Gun Co., 157th Inf., Camp Kearney, Calif., forest ranger, U. S. F. S.
Ineck, C. H. (Iowa State Col. ex, '16), Co. E, 20th Eng. (For.), A. E. F.
Ingebrightsen, R. (Mont. For. School, ex '19), Av. Corps.
Irish, C. F. (Ohio State Univ.), Camp Sheridan, Ala., with the 112th Sanitary Train doing mosquito control work.
Irwin, James A. (Mt. Alto, '12), Sgt., Co. C, 1st Bn., 10th Eng. (For.), France, Pa. Dept. For
Isaac, Leo (Minn. For. Sch.).
Isola, Vico C. (Yale For. School, '14).

JANOUCH, Karl L. (Univ. of Nebr., '17), Corp., Co. B, 1st Bn., 20th Eng. (For.), Am. Exped. Forces.
Jeffrey, Walter (Cornell, '18), Ensign in the Navy, Battleship "Missouri."
Jeffrey, W. M., Lt., Co. 6, E. R. O. T. C., Camp Lee, Petersburg, Va.
Jensen, Irving R., 20th Eng. (For.), forest ranger, U. S. F. S.
Jenson, A. F., U. S. F. S.
John, H. C. (Penn. State College, '14).
Johns, H. C. (Penn. State, '16), 20th Eng. (Forest).
Johns, Walter Ridgley, 158 Co., 35 Bat., 166th Depot Brigade, Camp Lewis, Am. Lake, Wash., U. S. F. S.
Johnson, Ansel R. H. (Biltmore), Naval Aviation section.
Johnson, C. H. (Mich. Ag. Col., '16).
Johnson, F. W. (student, Ohio State), 10th Engineers (Forest).
Johnson, Joseph H. asst. forest ranger, U. S. F. S.
Johnson, Oscar S. (Univ. of Minn., '16), Sgt., 10th Eng. (For.), U. S. F. S.
Johnson, Owen (Ore. Ag. Sch. For.), 20th Eng.
Johnson, R. J. (Mich. Ag. Col., '16).
Johnson, Sidney L. (Univ. of Wash., '18), Co. 67, 166th Depot Brigade, American Lake Encampment.
Johnson, W. R. (Mich. Ag. Col., '12).
Johnston, C. E. (Ore. Ag. Sch. For.), Corp., Co. D, 20th Eng.
Johnston, C. M. (Ore. Ag. Sch. For.), 20th Eng.
Jones, Alvin (Mont. For. School, ex '19), Coast Artillery.
Jones, E. F. (Yale, '11), Red Cross, Mission Anglo-Americaine de la Societe des Amis, 53 Rue de Rivoli, Paris, France, forest examiner, U. S. F. S.
Jones, John E. (Ohio State Univ., '17), 20th Eng. (For.), American Univ., Washington, D. C.
Jones, Luther G. (Yale, '16, short course), Co. B, 10th Eng. (For.), A. E. F.
Judson, Luchard (Yale For. School, '17), Naval Reserve, Yale Boathouse, New Haven, Conn.

KAESTNER, H. J., 20th Eng. (For.), Forester of W. Va., forest examiner, U. S. F. S.
Kane, William G. (Mont. For. School, '19), Marines, forest ranger, U. S. F. S.
Kartchner, Lafayette S., forest ranger, U. S. F. S.
Kelley, Capt. Arthur L. (Colo. Agr. Col.), 19th Co., Inf., O. R. C.
Kelly, Evan W., Capt. 10th Eng. (For.), forest examiner, U. S. F. S.
Kelley, Gordon L. (Macalaster College, Minn.). 10th Eng. (For.), A. E. F., France.
Kellogg, O. C. (Univ. of Wash., '20), Naval Tr. Sta., Univ. of Wash. Campus, Seattle, Wash.
Kemp, P. A., 25th Eng., Ft. Lawton, Washington, U. S. F. S.
Kenny, John, woodsman, Ten Saw Mill Units, Mass. For. Dept.
Kephard, G. S. (Cornell, '17), 10th Eng. Forest), France.
Kessler, N. T. (Penn. State, '21), Navy Hospital.
Ketcham, Louis, forest ranger, U. S. F. S.
Ketridge, John C., forest examiner, U. S. F. S.
Keyes, John H., Co. A, 20th Eng. (For.), A. E. F. (Yale, '12).
Kiefer, Francis, Capt. E. O. R. C., asst. dist. forester, U. S. F. S.
Kilbourne, E. I. (Cornell, '17).
Kilmer, William F. (Biltmore), Co. B, Signal Corps, Camp Sheridan, Ala.
Kimball, George W., forest examiner, U. S. F. S.
King, Robert F., 2nd Lt. Coast Artillery (Univ. of Wash., '19).
Kingsley, Ray (Mont. For. School), Co. K, 163rd Inf., A. E. F.
Kiser, Max (Ohio State Univ., '15), 330th Inf., Camp Sherman, Ohio.
Kishbaugh, W. (Penn. State, '17), 20th Eng. (For.).
Kittredge, Joseph, Jr., forest examiner, U. S. F. S.
Klassell, Alvin (Mich. Ag., Col.).
Klobucher, F. J. (Univ. of Wash., '14, and Yale, '16), 1st Lt., 20th Eng. (Fr.), A. E. F.
Knight, Herbert (Ohio State Univ.), O. N. G., Montgomery, Ala.
Knowlton, H. N., engineer in forest products, U. S. F. S.
Kobbe, William H. (Yale For. School, '04), Capt., 30th Eng. (For.), A. E. F.
Koch, Elers (Yale, '03).
Koechlein, John H., National Army, Camp Lewis, American Lake, Wash., fire guard, U. S. F. S.
Koleman, N., Sgt. (Mich. Ag. Col., '19).
Koomey, L. H. (Yale For. School, '12), Co. C, 1st Bn., 20th Eng. (For.), A. E. F.
Korista, Drohmir (Univ. of Minn.), Coast Art.
Kotsier, John, Capt., Field Art., Presidio, San Francisco, Cal., temporary force, U. S. F. S.
Kraebel, Charles J., (Univ. of Mich., '12), Sgt., 10th Eng. (For.) A. E. F., France, forest assistant, U. S. F. S.
Kraft, F. G. (Univ. of Mo.), 10th Engr. (Fr.).
Krause, John E., Co. H, 367th Inf., Camp Lewis, Wash., U. S. F. S.
Krell, Frederick C. (Penn. State, '13), Sergt. 1st class, 10th Eng. (Forest), Asst. Forester Pennsylvania Railroad.
Krell, J. W. (Penn. State, '17), timber inspection.
Krueger, Myron E. (Univ. of Cal., '17), 20th Engineers (Forest), forest ranger, U. S. F. S.
Kuemmerling, Karl (Ohio State Univ., '16), Hospital Unit.
Kunkle, A. V. (Univ. of Mont.), 10th Eng. (For.).

LAFON, John (Biltmore), Capt. 10th Eng. (For.), Forest Branch B. C.
Lamonte, A. D. (Penn. State, '18).
Langille, H. D., Major, 20th Eng. (For.), A. E. F.
Lackamp, Leo (Ohio State Univ.), Naval Reserve, U. S. S. Colpher, Municipal Pier, Chicago, Ill.
Lankenau, W. H. (Ore. Ag. Sch. For.), 20th Eng., Co. F.
Larzon, Arthur K. (Univ. of Wash.), Sgt., For. Reg., France.
Larrimer, W. H. (Ohio State Univ., '13), Officers' Training Camp, Chillicothe, Ohio.
Larson, Andrew H., 20th Eng. (For.), forest ranger. U. S. F. S.
Latane, William (Yale, '08), recommended for commission in 20th Eng.

Leach, Walter (Mt. Alto, '14), Co. Hdqtrs., 314th Inf., Camp Meade, Md., Pa. Dept. For.
Lee, Chester A. (Yale For. School, '17), Sgt., 10th Eng. (For.), A. E. F.
Lee, S. B., 2nd Lt. (Mich. Ag. Col., '17).
Leete, Bernard E. (Yale, '15), recommended for commission with Forest Regiment.
Lehr, Fred S. (Yale, '13), Marines, Paris Island, S. C.
LeMonte, A. D. (Penn. State, '18), timber inspection.
Lentz, Gustav H. (Yale For. School, '17), Sgt., 10th Eng. (For.), A. E. F., Maryland.
Leveaux, Cosmer (Mich. Ag. Col., '18).
Lewis, Ferry D., forest ranger, U. S. F. S.
Lewis, Trevor, 4th Eng., Vancouver, Wash., Headquarters detachment.
Lightfoot, Frank, 3rd Bn., 20th Eng. (For.), American Univ., Washington, D. C.
Lind, Fred (Univ. of Wash. Law), 1st Sgt., 45th Co., 166th Depot Brigade, Camp Lewis, American Lake, Wash., U. S. F. S.
Lindsey, Eugene L., 1st Lt. 10th Eng. (Forest), (Yale For. School, '11), forest examiner, U. S. F. S.
Littlefield, Theron R., Corp., Hdg. Co., 340th F. A., Camp Funston, Kas., forest ranger, U. S. F. S.
Livingston, R. (Penn. State, '19), 10th Eng. (For.).
Lockbridge, Earl (Mont. For. School), Coast Art.
Lockwood, Milton K. (Biltmore), 1st Lt., School of Military Aeronautics, Austin, Tex.
Loetzer, Louis C. (Student Mt. Alto, '19), Co. A, 41st Bn., 20th Eng. (For.), Camp Amer. Univ., Washington, D. C.
Lommasson, Thos., 10 Engineers (Forest), Am. Exped. Forces, France, U. S. F. S.
Long, Edward (N. H. State Col., '17), U. S. F. S.
Loof, H. W. (Ore. Ag. Sch. For.), 1st Lt., Av.
Lord, Milton (Univ. of Minn.), U. S. Marine Barracks Headquarters Detachment, 1st Rgt., Philadelphia, Pa.
Loud, William D., 20th Eng. (Forest).
Loughlin, John D., Amb. Corps (Cornell, '17).
Loveman, A. M. (Yale For. School, '16), Cost Inspection, Bethlehem Shipbuilding Corp., Providence, R. I.
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Loy, Elmer C (Iowa State Col. ex, '18), Corp., Radio Co., 109th Fld. Signal Bn., Camp Cody, New Mexico.
Lundgren, Leonard, Capt., 116th Engrs., Camp Mills, N. Y.
Luther, T. F., 20th Eng. (Forest), (Cornell, '17).
Lyle, Ben, 10th Eng. (For.), A. E. F., U. S. F. S.
Lyman, R. R. (Penn. State, '18), 10th Eng. (For.).
Lyon, A. C. (Mich. Ag. Col.).

MACKECHNIE, A. R., 2nd Lt. U. S. A. (Univ. of Wash., '18).
Malmstein, Harry E., grazing assistant, U. S. F. S.
Macaulay, N. G., Camp Lewis, American Lake, Wash., forest ranger, U. S. F. S.
Maloy, Thomas P., 20th Eng. (Forest), Co. B., 5th Bn. U. S. F. S.
Marckworth, Gordon D. (Yale For. School, '17, and Ohio State Univ.), Co. C, 20th Eng. (For.), Va. State For. Dept.
Marsh, A. Fletcher (Yale For. School, '11), Capt., Q. M. Sec., O. R. C., Wash., D. C.
Marston, Charles O. (Biltmore), 10th Engineers (Forest).
Marston, Major Roy L. (Yale, '02), 103rd U. S. Inf., Co. E. France.
Martin, Dean (Univ. of Minn., '11), Lt., 20th Eng. (For.), A. E. F.
Martin, Robert G. (Iowa State Col. ex, '19), 145th Aero Squadron, Kelley Field, So. San Antonio, Tex.
Marshall, Eugene, Co. A, 347th Machine Gun Bn., Camp Lewis, Tacoma, Wash., U. S. F. S.
Mason, David T. (Yale For. School, '07), Capt., 10th Eng. (For.), Prof. of For., Univ. of Cal.
Mason, Elmer Brown (Yale ex, '11), 1st Lt., N. G., Co. K, 120th Inf., Camp Service, Greenville, South Carolina.
Mathew, Waldo (Univ. of Wash., '19), Co. 8, 166th Depot Brigade, American Lake Encampment.
Mathews, Hugh, 20th Eng. (For.), Co. D, 4th Bn., American Univ. Training Camp, Wash., D. C.
Mattoon, Merwin A. (Yale, '14), Co. D, 10th Bn., 20th Eng. (For.), Amer. Univ., Wash., D. C.
Maudlin, Cecil V., Signal Corps, Asst. Eng. in Forest Products, U. S. F. S.
McAdams, Richard, U. S. Marines, Marine Barracks, Mare Island, Vallejo, Cal., U. S. F. S.
McCarthy, C. C. (Iowa State Col. ex, '16), 10th Eng. (For.), A. E. F.
Lyman, L. G. (Ore. Ag. Sch. For.).
McClure, B. M. (Mich. Ag. Col., '17).
McCollum, J. E. (Ore. Ag. Sch. For.), 10th Eng. (For.).
McCullough, Thomas E. (Yale For. School, '11), E. O. T. C., Camp Lee, Va.
McCutcheon, P. (Penn. State, '20), 20th Eng. (For.).
McCutcheon, T. D. (Penn. State, '20), 20th Eng. (For.).
McDougall, Edmond H. (Univ. of Wash., '17).
McDonald, W. A., Capt. (Mich. Ag. Col., '13).
McDowell, Willard, U. S. F. S.
McGillicuddy, Blaine (Univ. of Wash.), forest regiment, France.
McGlaughlin, Eugene R., 20th Eng. (Forest),
McKnight, Roscoe, 1st Lt. 10th Eng. (Forest), U. S. F. S.
McNulty, A. R. (Wyman Sch. Woods, '17), Co. C, 1st Michigan Engineers.
McNulty, L. Edgar (Mt. Alto For. Acad., '17), Co. C, 1st Bn., 10th Eng. (For.), A. E. F., Pa. Dept. For.
McPherson, Benj. D. (Mt. Alto For. Acad., '16), Co. C, 1st Bn., 10th Eng. (For.), A. E. F., Pa. Dept. For.
McQuarrie, Claude (Mont. For. School, ex '19), West Point.
Meek, Chas. R. (Mt. Alto, '12), Sgt., 20th Eng. (For.), Co. D, 4th Bat., A. E. F., Pa. Dept. For.
Meloney, Henry M., 20th Eng. (Forest), forest ranger, U. S. F. S.
Mendenhall, F. D., Corp., Headquarters Detachment, 7th Reg. Engr., Ft. Laevenworth, Kan., surveyor drattsman, U. S. F. S.
Mengel, A. W. (Wyman Sch. Woods, '17), 20th Eng. (For.).
Merrill, James D. (Biltmore), 2nd Lt., 342nd Inf., Camp Grant, Ill.
Mersnon, William B. (Biltmore, '10), 10th Eng. (Forest), sergt. 1st class.
Meschke, Karl G. (Mich. Ag. Col., '15), 20th Eng. (Forest), Co. E., 4th Bn. forest assistant, U. S. F. S.
Meyer, L. A., 10th Eng. (Forest).
Meyer, Leo. W. (Yale For. School, '17), Sgt., 1st class, 10th Eng. (For.), A. E. F.
Meyers, O. W. (Penn. State, '15), 10th Eng. (For.).
Middour, Joseph C. (Mt. Alto, '16), Co. C, 1st Bn., 10th Eng. (For.), A. E. F., Pa. Dept. For.
Miles, Clark, Lt., Co. C, 146 M. G. Bn., 41st Div., Camp Merritt, N. J., forest examiner, U. S. F. S.
Millar, W. N., Capt. (Yale For. School, '08), Univ. of Tor., Toronto, Can.; 10th Eng. (For.), A. E. F.
Miller, Edwin B. (Mt. Alto, '17), Co. C, 1st Bn., 10th Eng. (For.), France, Pa. Dept. For.
Miller, Fred H., forest ranger, U. S. F. S.
Miller, J. M. (Penn. State, '13), 10th Eng. (For.)
Miller, W. M. (Mich. Ag. Col., '19).
Minshall, Fred S. (Ohio State Univ.), 10th Eng. (For.).
Minner, Clifford R., forest ranger, U. S. F. S.
Mitchell, E. T. (Penn. State Col. For. Dept.), U. S. F. S.
Modisette, W. M. (Biltmore), Capt. 8th U. S. Cavalry
Moir, John (Minn. For. Sch., '13), Co. L, 351st Inf., Camp Dodge, Iowa.
Mongrane, Joe, woodsman, Ten Saw Mill Units (Mass. For. Dept.).
Montgomery, Ray C., Capt., Camp Funston, Ft. Riley, Kan., forest ranger, U. S. F. S.
Montgomery, W. Erdmann (Mt. Alto, '13), 2nd Lt., 335th Regular F. A., Camp Pike, Ark., Pa. Dept. For.
Moore, Barrington, Capt. (Yale For. School, '08), U. S. F. S., France.
Moore, M. M. (Oregon Ag. College), Troop A, 1st Cav., Ft. D. A. Russell, Wyo.
Moore, Louis R. (Biltmore), Canadian Eng. (For.), in England.
Moore, Walter M. (Univ. of Minn., '09), Lt., Signal Corps, in charge inspection of aeroplane stock, Vancouver Bks., Wash.
Morris, James G., 3rd Bn., 4th Bat., Seamen's Barracks, Mare Island, Cal.
Morris, R. D. (Iowa State Col. ex, '16), 10th Eng. (For.), Co. B, A. E. F.
Morrison, J. W. (Penn. State, '20), Amb. Corps.
Morrison, Tom, Co. A, 10th Engineers (Forest), Am. Exped. Forces, France, U. S. F. S.
Morrison, W. N. (Penn. State, '20), Amb. Corps.
Morton, J. Newton (Mt. Alto For. Acad., '16), Co. C, 1st Bn., 10th Eng. (For.), Pa. Dept. For.
Mosch, Walter (student at Mt. Alto), Co. E, 4th Bn., 20th Eng. (For.), A. E. F., Pa. Dept. For.
Moulthen, Fred (Mont. For. School), U. S. Marines.
Moyer, Marvin H. (Mt. Alto, '16), Co. B, 5th Bn., 20th Eng. (For.), A. E. F., Pa. Dept. For.
Mullen, Frank E. (Iowa State Col. ex, '20), Co. B, 10th Eng. (For.), A. E. F.
Munro, Willis (Yale, '12), Plattsburg, N. Y.
Murphy, Frank T. (Penn. State, '14), 20th Engineers (Forest), American Univ., Wash., D. C., U. S. F. S.
Murphy, E. C., 2nd Lt., U. S. A. (Univ. of Wash., '20).
Murphy, R. A. (Yale For. School, '18), Coast Patrol, stationed at Gibraltar
Musser, Ralph W. (Mt. Alto, '17), Co. B, 305th Fld. Art., Camp Lee, Petersburg, Va., Pa. Dept. For.
Mutz, George, forest ranger, U. S. F. S.
Muzzal, A. H. (Univ. of Cal., '16), 10th Engineers (Forest).
Myers, Edgar (Cornell, '17), 10th Engineers (For.).
Myers, Frank B., 6th Training Camp, Co. E, 316th Engrs., Camp Lewis, American Lake, Wash., forest assistant, U. S. F. S.
Myers, Reynolds V. (Biltmore), senior non. com., 10th Eng. (Forest).

NAEGELI, Fred (Univ. of Minn.), Av. Corps.
Naramore, David C. (Biltmore), 20th Engineers (Forest).
Nash, Royal F. (Yale ex., '08), Capt., 329th Fld. Art., Regimental Adjutant, Camp Custer, Battle Creek, Mich.
Neale, Eric (Ore. Ag. Sch. For.), Canadian Forces.
Neasmith, John Jr., 20th Eng. (Forest), (Syracuse, '17).
Neigle, William (Yale, '04), 20th Eng. (For.).
Nelson, C. A. (Mont. For. School, ex '19), Training Camp, American Lake, Wash.
Nelson, Enoch W., grazing assistant, U. S. F. S.
Nelson, Oscar Leo, 20th Eng. (For.), U. S. F. S.
Nelson, Ralph (Univ. of Minn.), Co. 88, U. S. M. C., Marine Barracks, Phila., Pa.
Nevitt, John V., forest ranger, U. S. F. S.
Newby, Arthur C., 20th Eng. (For.), American Univ. Campus, Washington, D. C., patrolman, U. S. F. S.
Newman, Nelson F. (Yale, '18), 68th Co., 164th Depot Brigade, Camp Funston, Fort Riley, Kan., U. S. F. S.
Nichols, Frank Q. (Wyman Sch. Woods, '16), Sgt., 20th Eng. (For.).
Nicholson, Nels O. (Univ. Mich. For. School), 10th Eng. (For.).
Nillson, Adolph (Ore. Ag. For. Sch.), Spruce Div., forest ranger, U. S. F. S.
Nordstorm, Edw. E., woodsman, Ten Saw Mill Units (Mass. Forestry Dept.).
Norman, J Nichols (Yale, '15), 1st Inf. Co., O. T. C., Camp Devens, Mass.
Norman, Sigvald (Minn. For. Sch., '12), Corp., 20th Eng. (For.), A. E. F.
Norton, J. Newton (Mt. Alto, 16), 10th Engineers (Forest), Co. C, France.
Norton, Thomas E., 20th Engineers (Forest), American University, Washington, D. C., for. ranger, U. S. F. S.
Norton, Dan L. (Notre Dame and Milwaukee), 10th Eng. (For.), Co. A, A. E. F., France.
Norton, Fred (Ohio State Univ., '17), Royal Flying Squadron, Ontario, Canada.
Norris, Conrad, Concrete, Washington, patrolman, U. S. F. S.
Nye, Elmer L., 20th Engineers (Forest), American Univ., Wash., D. C., U. S. F. S.

OAKLEAF, H. B. (Biltmore, '07, and Yale Short Course, '06), Capt., Signal Corps, Wash., D. C., forest examiner, U. S. F. S.
Oass, A. (Univ. of Wash., '18), R. O. T. C., Presidio, San Francisco, Cal.
O'Brien, George W. (Univ. of Wash., '17), with Spruce Production Division.
Odell, W. T. (Univ. of Wash., '12), Av. Tr. Camp, Yaphank, L. I., N. Y.
Oles, W. S., 20th Eng. (Forest), (Cornell, '16).
Oliver, B. L. (Ore. Ag. Sch. For.), 20th Eng. (For.).
Oliver, J. Earl, 10th Eng. (For.), A. E. F., forest ranger, U. S. F. S.
Olson, O. A. (Mich. Ag. College, '16).
Olson, Richard V., 20th Eng. (For.), American Univ. Tr. Camp, Washington, D. C., patrolman, U. S. F. S.
O'Neil, W. J. (Ore. Ag. For. Sch.), 2nd Lt., R. O. T. C.
Opalka, William P. (Univ. of Mont.), 20th Eng. (For.).
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Palm, Will, 20th Eng. (For.), U. S. F. S.
Pammel, Harold (Iowa State Col. ex, '20), Ft. Rutgers, Honolulu, Hawaii, 11th Co., C. A. A.
Park, Edwin C., Av. Branch, Ft. Sam Houston, San Antonio, Tex., patrolman, U. S. F. S.
Parker, Roscoe S., Capt., 10th Cav., Ft. Huachuca, Arizona.
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Partridge, Herbert E. (Biltmore).
Patterson, H. W. (Univ. of Mont.), 20th Eng. (For.).
Paulsen, Ed. (Ore. Ag. Sch. For.), Signal Corps, Spruce Regiment.
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Peabody, Joseph, 20th Eng. (Massachusetts For. Dept.)
Peachey, E. C., Co. B, 10th Eng. (For).
Peck, Allen S., Major, 10th Eng., forest insp., U. S. F. S., France.
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Perry, Jr., R. E. (Cornell, '17), 10th Engineers (Forest).
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Phillips, Reuben (Univ. of Minn.), 20th Eng. (For.), A. E. F.
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Plummer, Donald (Univ. of Wash., '20).
Poch, Fritz J. (Iowa State Col. ex, '20).
Port, Harold F. (Mt. Alto For. Acad., '16), Co. A, 1st Bn., 10th Eng. (For.), France, Pa. Dept. For.
Porter, O. M. (Yale For. School, '15), Lt., 10th Engr. (For.) A. E. F., France.
Porter, Harry C., Co. K, 361st Inf., Camp Lewis, Tacoma, Wash.
Post, Manlius J. (Yale, '13), Co. B, 5th Bn., 20th Eng. (For.), A. E. F.
Powell, Harry A., British Army (Univ. of Wash.).
Powers, James E. (Mt. Alto, '15), Master Engineer, Hdq Dtchmt., 103rd Engr., Camp Hancock, Augusta, Ga.
Powers, Victor S. (Univ. of Wash., '16). Battery A., Wash. Sig. Corps.
Pretat, Robert E (Yale ex., '17), Cadet, Av. Section, S. E. R. C., A. E. F.
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Prince, Edmund H., 2nd Lt. National Army.
Pryse, E. Morgan (Univ. of Mont.), 10th Eng. (For.), forest assistant, U. S. F. S.
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RAINSFORD, W. K. (Yale For. School, '06).
Ramdsdell, Williett F., Sgt., 10th Eng. (For.), Co. B., A. E. F., France, deputy forest supervisor, U. S. F. S.
Raither, Fritz (Ore. Ag. Sch. For.), Spruce Div.
Raine, Burton D. (Ohio State Univ., '17), Av.
Rase, Frederick W., Capt., 8th Co., 364th Suf., Camp Lewis, American Lake, Wash., surveyor, U. S. F. S.
Rand, E. A., 1st Sgt., 20th Eng. (Forest), (Univ. Me.), U. S. F. S.
Reber, H. E. (Penn. State, '18), timber inspection.
Reid, Thomas P. (Yale, '11), Co. E, 6th Bn., 20th Eng. (For.), Am. Exped. Forces.
Rendall, Raymond E. (Mass. Ag. and Univ. of Me.), U. S. F. S.
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Rhinehart, Marshall (Iowa State Col. ex, '20), Camp Clark, Tex.
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Rice, Herbert A. (Short Course Yale, '16), has enlisted in Av. Branch of the Navy as a L. M. M. (Aviation).
Richards, E. C. M. (Yale For. School, '11), Special Relief Agt., Amer. Committee on Armenian and Syrian Relief, Tabriz, Persia.
Richards, H. E. (Penn. State, '16), 10th Eng. (For.).
Richards, Allison M. (N. Y. State College, '17), Co. A, 5th Bn., 20th Eng. (For.), formerly with Hinckley Fibre Co., Hinckley, N. Y.
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Ringland, Arthur C., Capt. 10th Eng. (Forest). (Yale For. School, '05), forest inspector, U. S. F. S.
Ringold, Stanley L. (Univ. of Minn., '14), 10th Eng. (For.), France.
Rixson, C. L., forest clerk, U. S. F. S.
Roberts, Archer E. (Yale, '11), 20th Eng. (For.), forest ranger, U. S. F. S.
Roberts, A. K. (Univ. of Wash., '18), Base Hospital, American Lake Encampment.
Roberts, Wesley K. (Univ. of Wash., '18); Sec. 570 U. S., Amb. Corps, Allentown, Pa.
Robertson, Colin C. (Yale For. School, '07), Gunner, So. African Hvy. Art., 31 Tadbrooke Sq., London.
Robertson, J. M. (Mich. Ag. Col., '19), U. S. F. S.
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Rockey, K. E. (Yale For. School, '12), Lt., U. S. M. C.
Roeser, Jacob, Jr., forest assistant, U. S. F. S.
Rogers, H. J., U. S. F. S.
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Roop, C. L. (Mich. Ag. Col.).
Root, Lloyd (Mt. Alto For. Acad., '17), Co. C, 1st Bn., 10th Eng. (For.), France, Pa. Dept. For.
Rose, Logan (Univ. of Minn., '14).
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Ross, Roy B. (Bilt., '09), Hdqtrs. Co., 5th Bn., 20th Eng. (For.), A. E. F., Pa. Dept. For.
Roth, H. L. (Penn. State, '14), 10th Eng. (For.).
Rowland, Arthur L. (student Mt. Alto), Co. B, 3rd Bn., 20th Eng. (For.), A. E. F., Pa. Dept. For.
Rowland, Horace B., Jr. (Mt. Alto For. Acad., '15), Co. F, 1st Bn., 10th Eng. (For.), France, Pa. Dept. For.
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Russell, C. A., U. S. F. S.
Russell, J. C., 20th Eng. (For.), A. E. F., U. S. F. S.
Russell, Joseph P. (Univ. of Wash.).
Russell, William J., 20th Engineers, forest ranger, U. S. F. S.
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Sanderson, L. (Mont. For. School, ex '18), U. S. Marines.
Sands, R. S. (Wyman Sch. Woods, '17), Co. A, 1st Michigan Engineers.
Savre, James (Univ. of Minn., '13), 10th Eng. (For.), France.
Sayre, Jasper D. (Ohio State Univ.), Government Service, Alaska.
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Schmaeizle, Karl J. (Univ. of Wash.) For. Reg., France.
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Schmid, Walter W. (Minn. For. School), 10th U. S. Eng., A. E. F., France.
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Schubert, B. L. (Penn. State College Forestry Dept., '15)), U. S. F. S.
Schubert, Ben W. (Ore. Ag. Sch. For.), 2nd Lt., Co. C, 162nd Inf.
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Schwartz, Edwin R. (Univ. of Minn., '16), 20th U. S. Engineers, Co. C, 502 Bn. Eng.
Scofield, William L. (Yale For. School, '13), 10th Eng. (For.), A. E. F., forest ranger, U. S. F. S.
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Senft, Walter M. (student Mt. Alto), U. S. Av. School, Richfield, Waco, Texas, Pa. Dept. For.
Severance, H. M. (Univ. of Cal., '10), New York Natl. Guard.
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Shank, Philip (Univ. of Wash., '20), Coast Art.
Sharron, John L., Ten Saw Mill Units, Mass. For. Dept.
Shaw, Ezra I., Marines, Mare Island, Calif.
Shawhan, H. W. (Biltmore), 1st Lt., Ft. Caswell, Cape Fear, N. C.
Sheeler, George W. (Mt. Alto, '12), Sgt., Co. C, 502nd Eng., care of A. O. P., No. 713, France. Pa. Dept. For.
Shenefelt, Ira Lee (Mt. Alto, '16), Co. C, 502nd Eng., France, Pa. Dept. For.
Shephard, H. B., 2nd Lt., 10th Eng. (Forest), forester Lincoln Pulp Co.
Shephard, Robert, 20th Engineers (Forest), American Univ., Wash., D. C., U. S. F. S.
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Shultz, F. M. (Iowa State Col. ex, '19), 8th Aero Squadron, 42nd Co., A. E. F.
Sifferlen, Charles E. (Yale ex., '17), Co. A, 5th Bn., 20th Eng. (For.), A. E. F.
Siggers, Paul V. (For. School, Univ. of Mich., '16), U. S. F. S.
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Simpson, R. A. (Penn. State Col., '18), Amb. Corps.
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Sivyer, Ben E. (Univ. of Wisconsin), Co. F, 6th Bn., 20th Eng. (For.), A. E. F.
Skaar, Chris N., 20th Eng. (For.), forest ranger, U. S. F. S.
Skeels, Charles A., Aviation-Motorcyclist, clerk, U. S. F. S.
Skeels, Dorr, Capt. 10th Eng. (For.), Director of Forest School, Univ. of Montana.
Slonaker, L. V., 10th Eng. (For.), Am. Exped. Forces, France, U. S. F. S.
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Smith, Stanton G. (Yale, '05), 2nd Lt., Co. L, 302nd Inf.
Smock, J. C. (Ore. Ag. Sch. For.), Ordnance Dept.
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Speidel, Harold Allen (Yale, '14), 1st Lt. in the Field Art., Fort Sill, Okla.
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Spring, Samuel N. (Yale, '03), recommended for Captain, 20th Eng. (For.).
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Taylor, C. Robert (student Pa. State For. Acad.).
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Taylor, James (Mont. For. School, ex '20), U. S. Marines.
Taylor, L. W. (Univ. of Calif.), 20th Engineers (Forest)
Taylor, N. E., 10th Eng. (For.), A. E. F., France.
Texter, A. F. (Penn. State Col., '21), 20th Eng. (Forest).
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Thomas, John, Co. C, 1st Bn., 10th Eng. (For.), France, forest ranger, Pa. Dept. For.
Thomas, Walter P. (Mich. Ag. Col., '16), 2nd Lt.
Thompson, D. C., 2nd Lt. (Cornell, '17).
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Thompson, Raymond H., 10th Eng. (For.) A. E. F., France, forest ranger, U. S. F. S.
Thompson, P. A., 10th Eng. (For.), A. E. F., France.
Thornton, Hugh, 10th Eng. (For.), A. E. F., France, forest ranger, U. S. F. S.
Tilmen, L. (Mont. For. School), Training Camp, American Lake, Wash.
Tilson, Howard, 2nd Lt., 2nd Provisional Reg., 165 Depot Brigade, Camp Travis, Tex.
Tobey, Frank L. (Mich., '17), 10th Eng. (For.), forest assistant, U. S. F. S.
Tobin, Paul (Univ. of Minn., '13), Lt., Q. M. C., Jacksonville, Fla.
Torkelson, Timon (Univ. of Wash., '17), 2d Lt., Marine Corps, Quantico, Va.
Tower, P. V. (Mich Ag. Col., '16), Corporal.
Towsend, Claude R., Co. B. Marine Barracks, Mare Island, Vallejo, Calif. (Forest Ranger, U. S. F. S.).

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SEALED BIDS, MARKED OUTSIDE "BID, Northern Mount Scott Timber" and addressed to "The Superintendent of the Klamath Indian School, Klamath Agency, Oregon," will be received until 12:00 o'clock noon, Pacific Time, Tuesday, May 28, 1918, for the purchase of timber upon about 17,000 acres within Townships 29, 30 and 31 South, Range 7 East. The sale embraces approximately 100,000,000 feet of Yellow Pine and 1,000,000 feet of White Fir. The cutting of White Fir will be optional with the purchaser. Each bid must state for each species the amount per thousand feet, Scribner decimal C, log scale, that will be paid for all timber cut prior to April 1, 1921. Prices subsequent to that date are to be fixed by the Commissioner of Indian Affairs by three-year periods. No bid of less than Three Dollars and Thirty-five Cents per thousand feet for Yellow Pine, and Fifty Cents for White Fir during the first period will be considered. Each bid must be submitted in duplicate and be accompanied by a certified check on a solvent National Bank in favor of the Superintendent of the Klamath Indian School in the amount of $5,000. The deposit will be returned if the bid is rejected but retained if the bid is accepted, and the required contract and bond are not executed and presented for approval within sixty days from such acceptance. The right to reject any and all bids is reserved For copies of the bid and contract forms and for other information application should be made to the Indian Superintendent, Klamath Agency, Oregon.

Washington, D. C., March 12, 1918. CATO SELLS, Commissioner of Indian Affairs.

Trappe, W. S. (Penn. State, '18), timber inspection.
Trautman, George (Ohio State Univ., '14), 1st Lt., Montgomery, Ala.
Turner, F., 2nd Lt. (Univ. of Calif.).
Tuttle, L. J. (Ore. Ag. Sch. For.), retired 2nd Lt.
Tweedy, Temple (Yale For. School, '14), 2nd Lt., Bat. D, 304th Fld. Art., Camp Upton, N. Y.

VAN ARSDALL, HOWARD (student Mt. Alto), 2nd Lt., 8th Cav., El Paso, Tex., Pa. Dept. For.
Van Buskirk, S. S. (Iowa State Col., '14), Co. A, 5th Bn., Camp American Univ., Wash., D. C.
Van Horn, Harry E. (Mt. Alto For. Acad., '14), Co. A, 1st Bn., 10th Eng. (For.), France, Pa. Dept. For.
Van Riper, C. A. (Univ. of Cal.), 20th Engr. (For.).
Van Wickle, J. M. (Univ. of Wash., '18), Ry. Engrs. (18th U. S.), Co. E., U. S. A., Post Office 705, A. E. F., France.
Veach, C. H. (Iowa State Col., '17), Eng. Corps.
Verge, Fred, woodsman, Ten Saw Mill Units (Mass. For. Dept.).
Voight, Alfred W., forest ranger, U. S. F. S.

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Walsh, Harry A., Capt. Quartermaster's Dept., U. S. F. S.
Walter, Roy Irving (Biltmore), Camp Jackson, S. C.
Waltermire, Kenneth L., Av. Sec., Signal Corps, forest ranger, U. S. F. S.
Ward, Herbert S., Master Eng., 116th Engrs., Camp Green, Charlotte, N. C., clerk, U. S. F. S.
Warner, F. T. (Mich. Ag. Col., '16), 2nd Lt.
Warren, Avra M., 2nd Lt. National Army, 1st Bat., 310th Inf., Camp Dix, N. J.
Warren, M. C. (Univ. of Cal.), 10th Engineers (Forest).
Warren, Weis (Univ. of Minn.), U. S. Marine Corps, 71st Co., 7th Reg.
Waters, Louis H., 20th Engineers (Forest), Am. Univ., Wash., D. C., U. S. F. S.
Watkins, T. B. (Penn. State Col., '16), Fifth Engineers.
Watson, Clarence W. (Yale ex., '18), Barracks 5, F 17, Camp Merritt, N. J.
Webb, Walter R., Asst. Engineer in Forest Products, Radio Serv.
Webber, Burr (Iowa State Col. ex, '19), 10th Coast Art., Ft. Riley, Cal.
Weber, G. C. (N. Y. State College of Forestry, '16), U. S. F. S.
Weis, Warren (Minn. For. Sch.), U. S. Marine Corps, 71st Co., 7th Reg, Santiago de Cuba.
Weitknecht, Robert H., 1st Lt., The Presidio, San Francisco, Cal., forest assistant, U. S. F. S.
Weiwel, R. W. (Iowa State Col., '19), Amb. Driver, Camp Bowie, Ft. Worth, Texas.
Welby, Harry H. (Biltmore), 10th Engineers (Forest).
Weldin, Neil (Iowa State Col. ex, '18).
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Whitney, Raymond (Yale, '15), 20th Engineers.
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Wiggin, Gilbert H. (Univ. of Minn., '13), Sgt., 20th U. S. Eng. (For.), A. E. F.
Wilcox, J. M., Corp. Inf. (Univ. of Wash., '20).
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Williams, Hubert C., (Yale, '08), 1st Lt. 10th Eng. (For.), A. E. F.
Williams, Robert C. (Wyman Sch. Woods, '17), Corp., 2d O. F. A., Battery A.
Wilson, D. M. (Ore. Ag. For. Sch.), 2nd Lt., Cav., Troop B, 8th U. S. Cav.
Wilson, F. G. (Mich. Ag. Col.).
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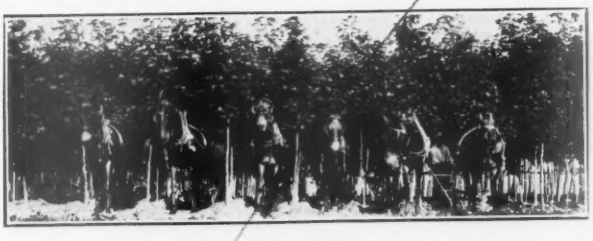

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Youngs, Lt. Homer S., 16th U. S. Inf., care of Adjutant General, War Dept., Washington, D. C., U. S. F. S.

ZAHN, George D. (Univ. of Wash., '20), Coast Art. Corps.
Zeller, R. A., Co. E, 161st U. S. Inf., Camp Mills, L. I., N. Y., forest assistant, U. S. F. S. (Report Continued in April Issue.)
Ziegler, E. A. (Direc. Penn. State For. Acad., Mt. Alto), Capt. Coast Art. Serv., Box 129, Fortress Monroe, Va., Pa. Dept. For.
Ziegler, Robert H., forest ranger, U. S. F. S.
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CURRENT LITERATURE

MONTHLY LIST FOR MARCH, 1918

(Books and periodicals indexed in the library of the United States Forest Service.)

FORESTRY AS A WHOLE

Proceedings and reports of associations, forest officers, etc.

Colorado—State forester. Third biennial report, 1915-16. 22 p. Fort Collins, Colo., 1916

Royal Scottish arboricultural society. Transactions, Jan., 1918, vol. 32, pt. 1. 116 p. pl. Edinburgh, 1918.

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Tasmania—Dept. of lands and surveys. Report for 1916-17. 37 p. Tasmania, 1917.

Texas—Agricultural and mechanical college—Dept. of forestry. Second annual report of the state forester. 7 p. College Station, Tex., 1917. Bulletin 8.)

FOREST DESCRIPTION

Schlich, William. Forestry in the Dominion of New Zealand. 28 p. Maps. London, Laughton & co., Ltd., 1918.

Sommerville, William. British forestry, past and future. 19 p. Oxford, University press, 1917.

FOREST INVESTIGATIONS

India—Forest research institute. Progress report for the year 1916-17. 24 p. Calcutta, 1917.

FOREST PROTECTION

Fire

Oregon—State board of forestry. Fire warden's handbook; Oregon forest fire laws; revised 1916. 48 p. Salem, Ore., 1916.

Washington forest fire association. Tenth annual report, 1917. 24 p. Seattle, Wash., 1918.

FOREST ADMINISTRATION

United States—National forest reservation commission. Report for the fiscal year ended June 30, 1917. 10 p. Wash., D. C., 1917.

FOREST UTILIZATION

Lumber industry

Lumbermen's credit association. Reference book, Feb., 1918. Chicago, Ill., 1918.

Wood-using industries

Howard, William G. Wood fuel. 8 p. Albany, N. Y., 1918. (New York—Conservation commission. Bulletin 16.)

Nellis, Jesse C. Lumber used in the manufacture of wooden products. 18 p. Maps. Wash., D. C., 1918. (U. S.—Agriculture, Dept. of. Bulletin 605.)

Ohio—Agricultural experiment station. Firewood and the woodlot. 2 p. Wooster, O., 1918.

Paul, C. E. Design of heavy timber mill construction buildings of southern pine. 4 p. il. Chicago, Ill., 1918. (National lumber manufacturers association—Engineering bureau. Technical letter no. 12-A.)

Paul, C. E. Heavy timber mill construction buildings. 3d ed. 71 p. il. Chicago, Ill., 1918. (National lumber manufacturers association—Engineering bureau. Bulletin 2.)

Secrest, Edmund. The production and use of fuel wood; coal shortage aided by use of waste timber; woodlots improved. 6 p. il. Wooster, O., 1918.

Texas—Agricultural and mechanical college—Dept. of forestry. Wood as emergency fuel. 4 p. College Station, Tex., 1918.

United States—Fuel administration—Conservation division. Burn wood and

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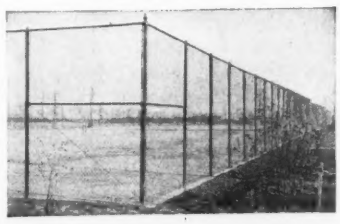

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save coal. 4 p. il. Wash., D. C., 1918.

Forest by-products

Chandler, Bernard Albert. Maple sirup and sugar production. 7 p. il. Albany, N. Y., State food commission, 1918.

United States—Bureau of the census. Census of manufactures, 1914: turpentine and rosin. 10 p. Wash., D. C., 1917.

AUXILIARY SUBJECTS

Conservation of natural resources

Canada—Commission of conservation. Report of the eighth annual meeting held at Ottawa, Jan. 16-17, 1917. 344 p. pl. Ottawa, 1917.

Maryland—Conservation commission. Bulletins 1-2. Baltimore, Md., 1917.

Botany

Rydberg, P. A. Flora of the Rocky Mts. and adjacent plains. 1110 p. N. Y., Pub. by the author, 1917.

Agriculture

United States—Department of agriculture—Office of farm management. Geography of the world's agriculture, by V. C. Finch and O. E. Baker. 149 p. maps. Wash., D. C., 1917.

Poisonous plants

United States—Dept. of agriculture—Bureau of animal industry. White snakeroot or richweed (Eupatorium urticaefolium) as a stock-poisoning plant, by C. Dwight Marsh and A. B. Clawson. 7 p. il. Wash., D. C., 1918.

Hygiene

United States — Treasury dept. — Public health service. Prevention of disease and care of the sick; how to keep well and what to do in case of sudden illness, 1917, by W. G. Stimpson; with a supplement on first aid to the injured, by R. M. Woodward. 247 p. il., pl. Wash., D. C., 1917.

PERIODICAL ARTICLES

Miscellaneous periodicals

American city, Jan., 1918.—Importance of well-shaded city streets, by J. G. Bennem, p. 69-75.

American florist, Jan. 19, 1918.—The Arnold arboretum, by Edward I. Farrington, p. 4-6.

Aviation, March 1, 1918.—The artificial seasoning of wood, by Percy Groom, p. 164-8.

Colorado manufacturer and consumer, Feb., 1918.—Summer home sites in the Colorado national forest, by Steele, p. 16-17.

Country gentleman, Feb. 23, 1918.—In a northern sugar forest, p. 33.

Field and stream, March, 1918.—On chopping wood, by Warren H. Miller, p. 932-4.

Forest and stream, March, 1918.—Sheep or elk in our forest reserves? Their natural range threatened by the encroachment of sheep; quick action alone will save the elk herd of Yellowstone

Park from extinction, by Emerson Hough, p. 137-141, 176-8.

Gardener's chronicle, Feb. 2, 1918.—The home-grown timber trade, by A. D. Webster, p. 42-3.

Gardener's chronicle of America, Feb., 1918.—Wood as a substitute for heating greenhouses, by Arthur Smith, p. 45.

High school journal, March, 1918.—A tree guessing contest, by J. S. Holmes, p. 16.

Illustrated world, Feb., 1918.—Millions in America's scrap heaps, by W. Flemming, p. 917-18.

Journal of the New York botanical garden, Nov., 1917.—Cactus hunting on the coast of South Carolina, by John K. Small, p. 237-46.

New country life, Feb., 1918.—The osage orange, by C. C. Osborne, p. 80 b, 82.

New country life, March, 1918.—A North Carolina white oak, by Richard B. McLaughlin, p. 92, 94.

New Zealand journal of agriculture, Jan., 1918.—Insignis-pine disease, by D. E. Hutchins, p. 37.

Outlook, Jan. 23, 1918.—Community woodchopping day, by K. B. Welles, p. 154-5.

Phytopathology, Feb., 1918.—Notes on the over-wintering of forest tree rusts, by James R. Weir and Ernest E. Hubert, p. 55-9.

Phytopathology, March, 1918.—Notes on forest tree rusts, by James R. Weir and Ernest E. Hubert, p. 114-18.

Pleasureland, Feb., 1918.—When summer comes again, by Wallace I. Hutchinson, p. 1.

Progressive farmer, Feb. 9, 1918.—How I get rid of stumps, by P. M. Eames, p. 162.

Sierra club bulletin, Jan., 1918.—The junipers of Lake Valley, by Cornelius Beach Bradley, p. 298-303.

United States—Bureau of labor statistics. Monthly review, Jan., 1918.—The soldier, the worker, and the land's resources, by Benton Mackaye, p. 48-56.

United States—Dept. of agriculture. Journal of agricultural research, Feb. 18, 1918.—Gipsy-moth larvae as agents in the diessemination of the white-pine blister-rust, by G. Flippo Gravatt and G. B. Posey, p. 459-62.

United States—Dept. of agriculture. Monthly crop report, Jan., 1918.—Cordwood used on farms, p. 4.

United States—Dept. of agriculture. Weekly news letter, March 13, 1918.—Food from the forest; native trees and shrubs furnish a large variety of fruits, nuts, and other edibles, p. 6; Wood fuel reserve; make provision for plentiful supply of firewood for next winter, p. 7.

Wallace's farmer, Jan. 11, 1918.—Fuel value of wood, p. 44.

Trade journals and consular reports

American lumberman, Feb. 9, 1918.—How acorn brand oak flooring is made, p. 41; Report of executive grading commission, Hardwood manufacturers association of the United States, p. 47.

American lumberman, Feb. 16, 1918.—How woods compare for airplane manufacture, p. 37.

American lumberman, Feb. 23, 1918.—The relation between the organization of operation and efficient competition in the lumber industry, by Wilson Compton, p. 1, 70-2; Truck body hollowed out of a redwood tree, by Charles Kellogg, p. 73.

Barrel and box, Feb., 1918.—Federal standard barrel law, by U. S. Bureau of standards, p. 19-20; Standard specifications for canned food containers, p. 34-6.

Canada lumberman, Feb. 15, 1918.—What forest protection means to civilization, by Ellwood Wilson, p. 60-2.

Canada lumberman, March 1, 1918.—The hydroplane in forest protection, by C. H. Gibbons, p. 25; Timber resources of northern Manitoba, by J. A. Campbell, p. 34.

Engineering and contracting, Feb. 20, 1918.—Method of burning fat stumps in place, p. 186; Notes on blasting stumps in sandy ground, p. 204.

Hardwood record, Feb. 25, 1918.—Mahogany as a veneer wood, p. 25-6; Prospective uses of minor tree species, p.

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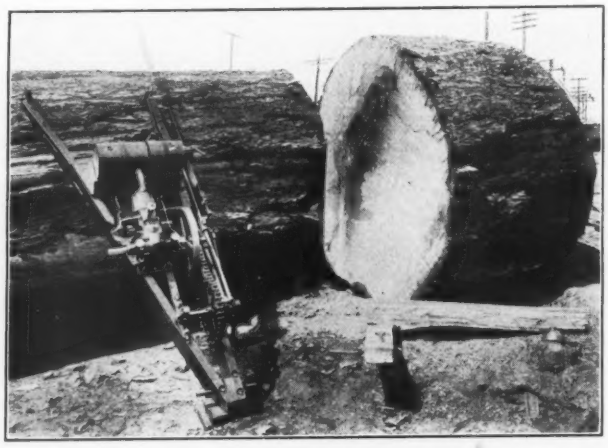

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27-30; The most elastic American wood, p. 34.

Hardwood record, March 10, 1918.—American veneers of foreign wood, p. 27-30.

Lumber trade journal, March 15, 1918.—The Daugherty type of wooden vessel makes it possible for pine manufacturers to supply material in unlimited quantities, p. 11, 18.

Lumber world rev., Feb. 18, 1918.—Recent development of wood construction in relation to the fire hazard, by Herman von Schenck, p. 26-7.

Paper, Feb. 13, 1918.—The estimation of cellulose in wood, by B. Johnsen and R. W. Hovey, p. 36-52; Nitrocellulose from woodpulps, by W. E. Byron Baker, p. 78-82; Bibliographic standards recommended for the Technical association of the pulp and paper industry, by Henry E. Surface, p. 150-4.

Paper, Feb. 20, 1918.—Woodpulp for surgical dressings, p. 13.

Paper, Feb. 27, 1918.—Making artificial silk from cellulose, p. 11-16; Make state forests productive; an argument for scientific lumbering in the Adirondack Mts., by A. B. Recknagel, p. 22 4.

Paper mill, Feb. 16, 1918.—Maine's wood crop, p. 7.

Pulp and paper magazine, Feb. 7, 1918.—Applying technical education to the paper industry of Canada, by George Carruthers, p. 125-7.

Railway maintenance engineer, Jan., 1918.—Salt treatment of timber piles, by Hermann von Schenck, p. 9-10.

Railway review, Feb. 16, 1918.—Situation in the tie market, by M. T. Shaney, p. 224-5.

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AMERICAN FORESTRY will publish each month, for the benefit of those who wish books on forestry, a list of titles, authors, and prices of such books. These may be ordered through the American Forestry Association, Washington, D. C. Prices are by mail or express prepaid.*

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Southern lumberman, Feb. 23, 1918.—Cut-over lands will help solve labor problem after war, by Benton Mackaye, p. 36.

Timber trade journal, Feb. 16, 1918.—Strength of timber and safe loads, by Seymour Walker, p. 233.

Timber trade journal, Feb. 23, 1918.—The chief varieties of softwood, p. 272-3; The preservation of timber in coal mines, by Percy Groom, p. xxiii, xxv.

Timberman, Feb., 1918.—The forest resources of Norway described, by J. H. Boe, p. 48 K.

United States daily consular report, Feb. 21, 1918.—Wood combs now being made in Germany, p. 691.

United States daily consular report, March 7, 1918.—Wood pulp substitute for absorbent cotton, p. 867; Fuel value of cocoanut shells, by Henry D. Baker, p. 869.

United States daily consular report, March 9, 1918.—Manufacture of paper from bamboo in Trinidad, by Henry D. Baker, p. 898.

United States daily consular report, March 13, 1918.—Timber trade in Germany during the war, p. 949; Ornamental hardwoods of Australia, by Howard A. Treat, p. 956-8.

Veneers, March, 1918.—Red cedar veneers for chests, by H. C. Cain, p. 12.

West Coast lumberman, March 1, 1918.—Eleven billion feet of spruce timber in Oregon and Washington, p. 20; England fears severe shortage of timber supplies in the future, p. 38-9.

Wood turning, March, 1918.—Turning table legs, showing factory operation, by James F. Hobart, p. 7-8; Turning plow handles, by James Francis, p. 20-1.

Wood-worker, Feb., 1918.—Making the airplane propeller, by L. Maileaux, p. 26; Clothes pegs as a side-line, by A. W. W., p. 45-6.

Forest Journals

American forestry, March, 1918.—Flying on wings of spruce, by E. A. Sterling, p. 133-139; The abomination of desolation, p. 140; Americans in the French forests, by Henry S. Graves, p. 141-143; Forest Service man selected as city manager of Albuquerque, p. 144; Blasting stumps near buildings, by John N. Lewis, p. 144; Perhaps our greatest national park, by Robert Sterling Yard, p. 145-150; Studies of leaf and tree (Part III), by R. W. Shufeldt, p. 151-159; A tree guessing contest, by J. S. Holmes, p. 159; The humming birds and swifts, by A. A. Allen, p. 160-164; How the Forest Service has helped the stockmen, by Albert F. Potter, p. 165-169; Tree tied in a knot, p. 169; Ship built of mahogany, p. 169; Nuts: a substitute for meat, by A. Mildred Brennan, p. 170-172; New home of forestry at the University of California, p. 173-176; Donations to the welfare fund for lumbermen and foresters in war service, p. 177, 179; Slacker land and food facts, by Charles Lathrop Pack, p. 178-179; American foresters in military service, p. 180-188.

Biltmorean, March, 1918.—Forests of the Coos Bay region, Oregon, by H. D. House, p. 3-7; Lumber prices during the past year, by R. A. Swift, p. 7-8.

Hawaiian forester and agriculturist, Jan., 1918.—The Paradise tree, by Vaughan MacCaughey, p. 20-2.

Journal of forestry, Feb., 1918.—Forestry and the war, by B. E. Fernow, p. 149-54; The technical forester in national forest administration, by L. F. Kneipp and others, p. 155-67; Relation of stimuli to the cone production of western hemlock, by Russell Watson, p. 168-75; Valuation of damages to immature timber, by W. N. Sparhawk, p. 176-91; The white pine weevil and its relation to second growth white pine, by S. A. Graham, p. 192-202; Comments on Korstian's classification of forestry literature, p. 203-9; Some social aspects of forest management, by Benton Mackaye, p. 210-14; Growth and management of pinon in New Mexico, by Herman H. Chapman and C. E.

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Behre, p. 215-17; Woodland versus woodlot in farm forestry, by Wilbur R. Mattoon, p. 218-20.

North woods, Feb., 1918.—Maple syrup and maple sugar, by Ross Aiven Gortner, p. 15-17.

BOOK REVIEW

Working Plan for Forest Lands of Peninsula State Park, Door County, Wisconsin. By Cedric H. Guise. State of Wisconsin, Conservation Commission, Bulletin No. 3, pp. 45, figs. 5, and map. Madison, Wisconsin, 1917.

Peninsula State Park is a much visited forest of 3,733 acres. Three-fourths of this Park is wooded. "With a view to managing the forests of this Park for sustained yield," says the Introduction, "and for organizing the forests and forest lands to their highest productive capacity, a forest survey was made of this area, and from the data secured, a complete working plan was prepared for the ensuing ten years."

Then follows the working plan itself which, so far as the reviewer is aware, is the only published working plan made in conformity to the latest developments in forest organization.

The plan itself divides into the following main headings—with the pages devoted to each:

1—Orientation—Location, History, Physiography and Social and Industrial Features, 3 pages.

2—Foundation — Estimate, Stand and Stock, Forest Types, Increment, Division of Area, 6½ pages.

3—Recommendation—Policy of State, Objects of Management, Silvicultural management, 3½ pages.

4—Regulation of Cut—Amount, Location of Cut, Planting Plan, 5 pages.

5—Administration, ¼ page.

6—Permanent Improvements, ¾ page.

7—Forest Protection, 1 page.

8—Control and Revision, ½ page.

9—Appendix, 16¼ pages.

From this the brevity of treatment of the plan proper is at once apparent. Data "not essential to the execution of the working plan" are put in the Appendix. Furthermore, wherever possible the information has been presented in tabular form. There are seven tables in the main body of the plan and thirteen in the appendix—twenty all told.

These first seven tables will bear analysis and deserve special study. The first table gives the estimate of timber by species and shows the following species in order of greatest quantity: (board feet) hemlock, maple, beech, white pine, oak, balsam, red pine and ash. The total volume is nearly five million board feet.

Table 2 is a stand table, showing number of trees per average acre. Here the order of species is: Paper birch, maple,

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poplar, hemlock, beech, cedar, balsam, white pine, red pine, and oak.

Table 3 is a stock table for the average acre.

Table 4 shows the Current Annual increment, based on Pressler's formula, of the eleven chief species. This is a remarkably good piece of work. The C. A. I. per cents are applied to the corresponding values in the stock table and give the increment in board feet or cubic feet per acre, as the case may be.

Table 5 shows the adopted diameter limits and the corresponding rotation ages and C. A. I. per cents. "For the saw-timber species the C. A. I. drops below 2 per cent beyond the diameter limit." These limits are mostly 14 inches, D. B. H.

Table 6 shows the allowed annual cut for each species, based on average of determination of cut by three standard methods,* and gives the cut for the next decade as 1,000,000 board feet, 2,300 cords, and 2,000 posts. This cut is distributed in designated areas (Blocks) and according to forest types.

Table 7 is the general planting plan for the decade ensuing. Some 600 acres will be planted. (The detailed plantings for each year are given in Table 16, covering four pages.)

The State adopts a sane combination of pleasure and profit from its forest. Here is its policy:

"This Park, together with several others in the State, was purchased as a place for recreation. This is the chief use to which it will be put. It has been felt that the interests of the public would best be served if the forests of the Park were placed under management, so that revenue would result, and the open lands, now idle, be made productive by growing trees.

"These policies have been combined into one, and in the future, the Park will be managed both for a recreation forest, and for a supply of timber, the latter not to conflict in the slightest degree with the former."

The working plan is the instrument for accomplishing these desired results. The Conservation Commission of Wisconsin is to be congratulated upon such a progressive viewpoint and upon publishing such a simple, straightforward plan of management. "He who runs may read" what forestry proposes to do. Here is, at last, an available example of the "working plan that works" of which the reviewer dreamed ten years ago.

A. B. RECKNAGEL.

** That is by 1—Swiss Method, 2—Hufnagl's Method, and 3—Von Mantel's Method described in "Forest Working Plans," second edit., John Wiley & Son, N. Y., 1917, as Nos. 4, 12, and 2, respectively (pp. 67-124).*

The results, in allowed cut for year, are:

	Board measure
1—Swiss Method	*147,643 feet*
2—Hufnagl's Method	*135,345 "*
3—Von Mantel's Method	*77,503 "*

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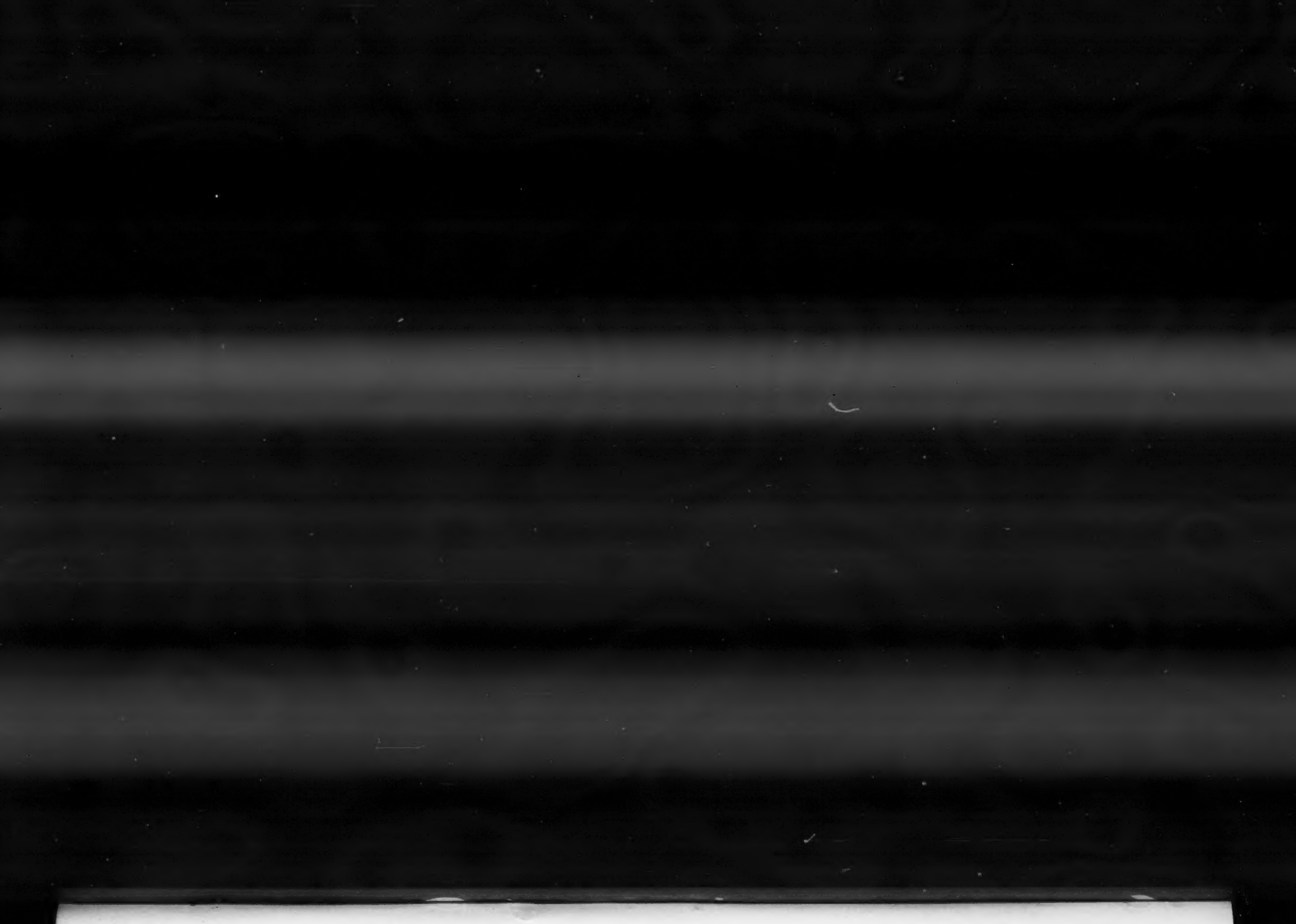
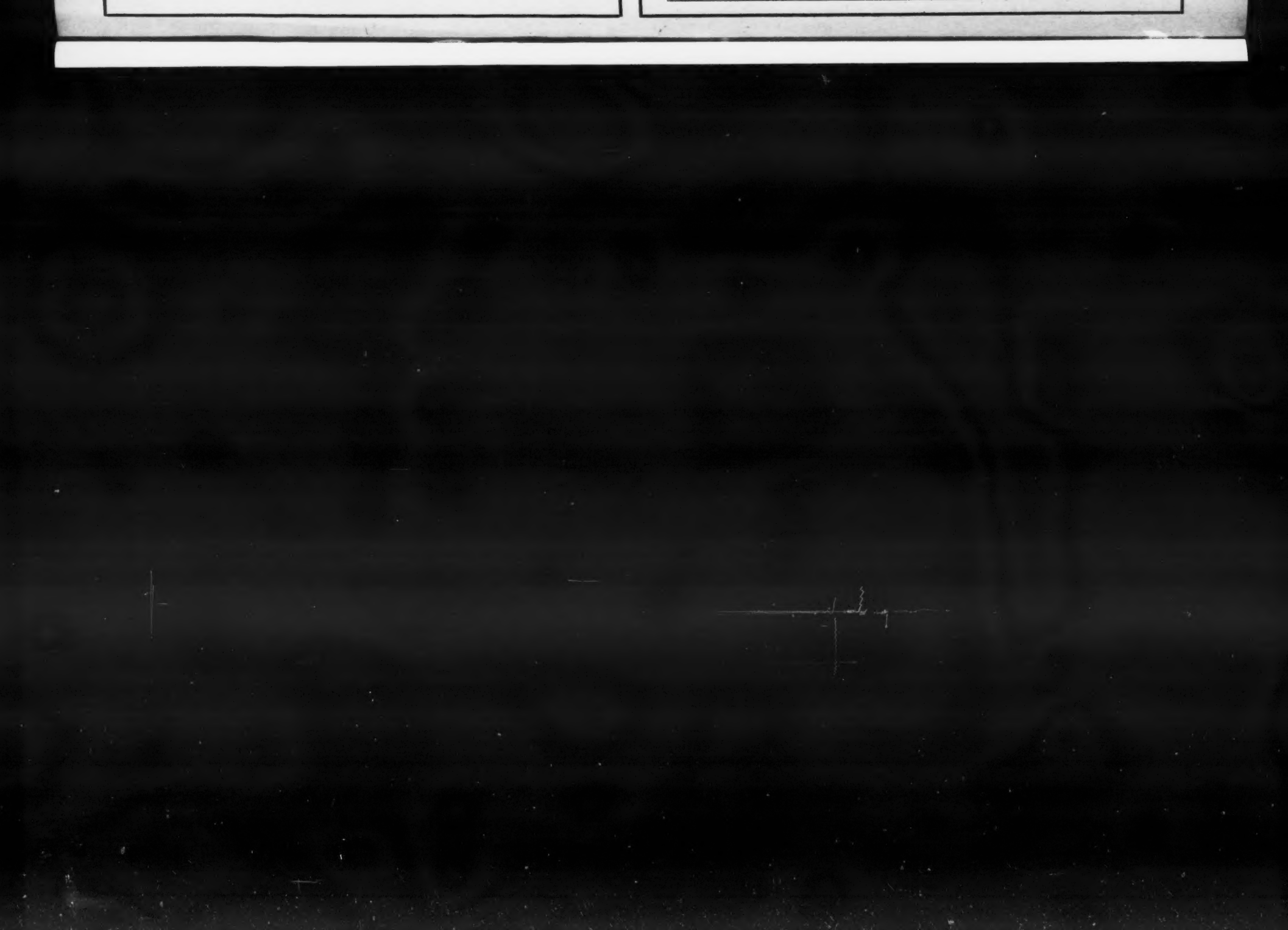
For further information and catalogue, address: The Director of the School of Forestry, New Haven, Connecticut, U. S. A.





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Declaration of Principles and Policy of The American Forestry Association

IT IS A VOLUNTARY organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

IT IS INDEPENDENT, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

IT ASSERTS THAT forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.

IT DECLARES THAT FORESTRY is of immense importance to the people; that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay $367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

IT RECOGNIZES THAT forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon National and State forest reserves for the benefit of the public.

IT WILL DEVOTE its influence and educational facilities to the development of public thought and knowledge along these practical lines.

It Will Support These Policies

National and State Forests under Federal and State Ownership, administration and management respectively; adequate appropriations for their care and management; Federal co-operation with the States, especially in forest fire protection.

State Activity by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners, non-political departmentally independent forest organization, with liberal appropriations for these purposes.

Forest Fire Protection by Federal, State and fire protective agencies, and its encouragement and extension, individually and by co-operation; without adequate fire protection all other measures for forest crop production will fail.

Forest Planting by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose; and also planting by private owners, where profitable, and encouragement of natural regeneration.

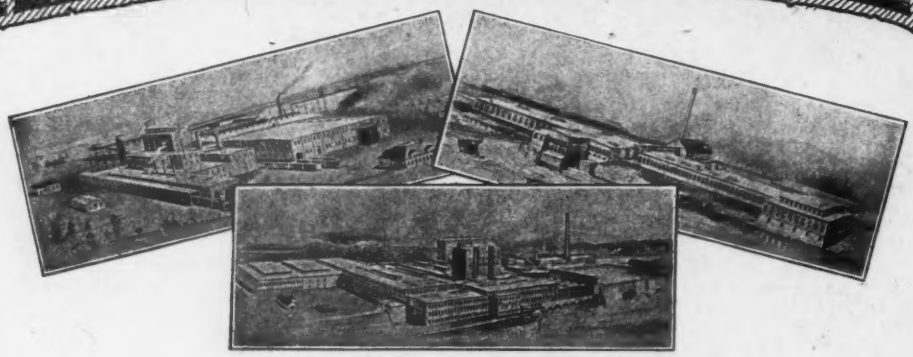
Forest Taxation Reforms removing unjust burdens from owners of growing timber.

Closer Utilization in logging and manufacturing without loss to owners; aid the lumberman in achieving this.

Cutting of Mature Timber where and as the domestic market demands it, except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

Equal Protection to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

Classification by experts of lands best suited for farming and those best suited for forestry; and liberal national and State appropriations for this work.



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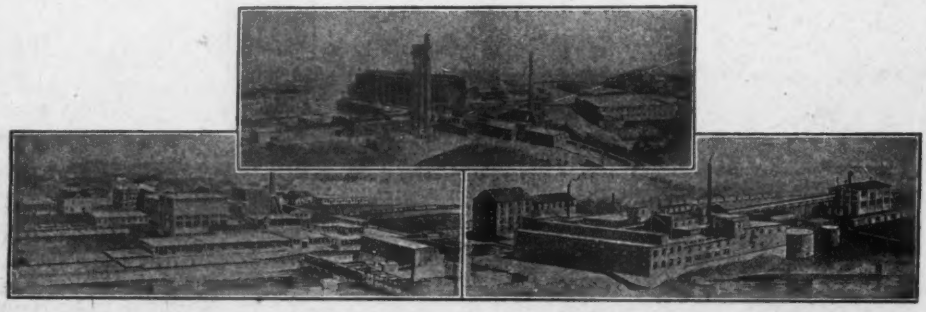
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